



FACULTAD DE INGENIERÍA Y ARQUITECTURA  
ESCUELA PROFESIONAL DE INGENIERÍA INDUSTRIAL

**FORMACIÓN, CAPACITACIÓN E INDUCCIÓN DE  
INSPECTORES DE HIDROCARBUROS Y EL  
ORDENAMIENTO GENERAL DE LAS ACTIVIDADES DEL  
ÁREA DE OPERACIONES EN LA EMPRESA AMSPEC  
SERVICES LLC**

**PRESENTADO POR  
JOAN LUIS CARRILLO ALAVENA**

**TRABAJO DE SUFICIENCIA PROFESIONAL  
PARA OPTAR EL TÍTULO PROFESIONAL DE INGENIERO INDUSTRIAL**

**LIMA – PERÚ**

**2019**



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**A la memoria de mi padre, un hombre excepcional, que con su sacrificio, consejos y enseñanzas, hizo de mí, el hombre, padre y profesional que soy.**

**A mi esposa y a mis hijos por su comprensión, en el tiempo lejos de ellos, a quienes les agradezco y dedico este informe, por su apoyo constante en la obtención de mis metas profesionales.**

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## **RESUMEN**

En el presente trabajo de suficiencia profesional, se describe el Programa de capacitación de Normas API y el de MSDS online, a fin de incentivar el uso de procedimientos y técnicas estándares, que se encuentran en las Normas ASTM (American Society for Testing and Materials) y principalmente en las Normas API (American Petroleum Institute). El objetivo general de dichas normas fue el de implementar el mencionado Programa con miras a sensibilizar a los inspectores de hidrocarburos en el campo. Ello contribuyó al mejoramiento de las labores e igualmente, estar a la vanguardia de conocimientos y técnicas en la industria petrolera, y de esa forma, cumplir con los estándares de calidad y seguridad industrial, así como el ordenamiento general de las actividades del Área de Operaciones de la Empresa Amspec Services LLC (Limited Liability Company).

Por otra parte, con la labor que se desarrolló de supervisión, control y seguimiento de los avances, se resolvieron dudas e inquietudes de los inspectores. Y con los resultados de los indicadores cuantitativos y cualitativos se pudo acceder fácilmente a información que permitió realizar correctivos y mejoras. Gracias a este Programa de Capacitación de Normas y MSDS online, el Índice de Frecuencia (IF), al final del año 2012, se redujo de 37 accidentes cada 200,000 H-H, a 15.

## **ABSTRACT**

In the present professional sufficiency report, describes the training Program of API standards and the MSDS online, in order to encourage using procedures and standard techniques, which is found in the ASTM Standards (American Society for Testing and Materials) and mostly in the API Standards (American Petroleum Institute). The general objective of these standards was to implement the aforementioned program with a view to sensitize the hydrocarbons inspectors in the field. This contributed to the improvement of the job and also, to be at the forefront of knowledges and techniques in the oil industry, and in this way, to comply the standards of quality and industrial safety, as well as put in general order the Operations Area Activities of the Company Amspec Services LLC (Limited Liability Company).

Moreover, with the job that was developed of supervision, control and follow-up of the advances, were resolved doubts and concerns of the inspectors. And with the results of the quantitative and qualitative indicators, it was possible to have quick information that allowed to make corrections and improvements. Thanks to this Standards Training Program and the MSDS online, the Frequency Index (IF), at the end of the year 2012, was reduced from 37 accidents every 200,000 H-H, to 15.

## INTRODUCCIÓN

El presente trabajo de suficiencia profesional desarrolla un Programa de Capacitación para implementar el uso de procedimientos y técnicas estándares, que se hallan en las Normas ASTM (American Society for Testing and Materials), básicamente en las Normas API (American Petroleum Institute); ambas ayudaron al mejoramiento continuo de las labores de los inspectores de hidrocarburos, y con el uso de la tecnología (MSDS online) les permitió tener los conocimientos (Normas de Calidad y Seguridad), y permanecer siempre en vanguardia; así como, el ordenamiento general de las actividades del Área de Operaciones de la Empresa.

La empresa, AmSpec Services LLC (Limited Liability Company), ha analizado y medido de manera independiente y precisa los productos petrolíferos y petroquímicos en los Estados Unidos, el Caribe, América Latina y en todo el mundo, durante más de treinta años. Se dedica a brindar un servicio de calidad que supera las expectativas de los clientes. La Compañía y los empleados se esfuerzan en conjunto por lograr el más alto grado de desempeño de calidad, que se logra a través de sistemas claros y bien documentados, la capacitación adecuada, las calificaciones y la experiencia de los empleados, y mediante la mejora continua de todas las operaciones generales.

En el año 2012, fue necesario poner en marcha la implementación del programa de capacitación MSDS online para abordar problemas de capacitación e inducción graves que resulten de problemas experimentados en el campo o en la oficina.

Los manuales estándares de la ASTM (American Society for Testing and Materials) y del API (American Petroleum Institute) sirvieron para elaborar cursos de capacitación, a fin de mejorar el desempeño de los inspectores de hidrocarburos en el campo.

Este trabajo consta de cuatro capítulos. En el primero, se especifican, cronológicamente, roles y funciones, actividades, aprendizaje empírico y formal. También se precisa la experiencia significativa. En el segundo, se describe parte de la historia de la empresa AmSpec Services LLC, su estructura orgánica, la visión y la misión, los productos y los servicios que brinda. En el tercero, se detalla la aplicación profesional en la que se relata la definición del problema, el diseño de la solución, la ejecución de la solución, y el seguimiento y control del proyecto; el cual con el uso de procedimientos y técnicas estándares (Normas ASTM y Normas API) ayudaron a mejorar las labores de los inspectores de hidrocarburos en el campo, en la empresa AmSpec Services LLC. Y en el cuarto capítulo, se expone una reflexión crítica de la experiencia.

## CAPÍTULO I

### TRAYECTORIA PROFESIONAL

#### 1.1 Experiencia profesional

A lo largo de más de 10 años de experiencia laboral, se tuvo la oportunidad de ser parte de diversas empresas que prestan servicio de inspección en el área de hidrocarburos y sus derivados, en donde se pudo obtener experiencia en las áreas de inspección, de capacitación, de seguridad y en el manejo correcto de los equipos de inspección. A continuación, un resumen de las experiencias mencionadas.

##### **a) Intertek Testing Services Perú SA**

Empresa de servicios de inspección para diversos productos tales como hidrocarburos (incluyendo Biodiesel, Gasolina, Residuales, etc.)

Fecha: Desde octubre 2015 a enero 2017

Asistente de Operaciones de Hidrocarburos:

- Cumplir oportunamente el registro de las nominaciones escritas y verbales de los clientes que hablan inglés, a fin de transmitir la información correcta al personal encargado de la operación.
- Supervisar el desarrollo del personal involucrado en las operaciones de carga y/o descarga, para mantener actualizado al cliente de todos los pormenores de su operación.
- Dar seguimiento a las necesidades de capacitación del personal a cargo, en coordinación con el Supervisor de Operaciones.
- Elaborar planes de Inducción para el personal de nuevo ingreso.
- Revisar la elaboración de reportes finales generados antes de liberarlos para su envío al cliente.

- Mantener una constante comunicación y coordinación con el Supervisor de Operaciones para el buen desarrollo de las tareas de inspección.
- Participar como instructor en los cursos de capacitación dictados por el área, para un mejoramiento continuo de conocimiento de los inspectores.
- Traducir al idioma español los artículos enviados por Intertek Corporation para la distribución y conocimiento del personal.

**Logros:**

- Mejora en registrar, oportunamente, las nominaciones escritas y verbales de los clientes que hablan inglés logrando un conveniente trato con los clientes.
- Mejora en el desarrollo del personal involucrado en las operaciones de carga y/o descarga, actualizaciones más exactas y continuas al cliente de todos los pormenores de su operación.
- Se implementó un deseable cronograma de capacitación del personal a cargo.
- Se logró la entrega de los reportes finales al cliente antes de 48 horas.
- Mejora en la comunicación y coordinación con el Supervisor de Operaciones, con lo que logró minimizar los errores en las operaciones de inspección.
- Se incrementaron las capacitaciones dictadas por el área, a fin de enriquecerlos de conocimientos a los inspectores.
- Se mejoró la distribución de artículos traducidos al idioma español de Intertek Corporation.

**b) Amspec Services LLC en Linden, New Jersey**

Empresa de servicios de inspección de hidrocarburos y sus derivados en todo los EE.UU., el Caribe y América Latina.

Fecha: Desde julio 2011 a abril 2013

Supervisor de Capacitación y Seguridad para Inspectores de Hidrocarburos:

- Capacitar en el uso de procedimientos y técnicas estándares (Normas API) a los inspectores en la oficina de New Jersey.
- Entrenar en el correcto uso de los equipos para el muestreo de hidrocarburos a los inspectores.

- Elaborar el cronograma de capacitación obligatorio en terminales para los inspectores.
- Implementar el sistema MSDS on-line para los inspectores en todas las oficinas de la Costa Este de los Estados Unidos.
- Elaborar los formularios para un rápido acceso a la información por parte de los inspectores.
- Implementar nuevos formatos para la elaboración y actualización de la información de los inspectores en todas las oficinas de la Costa Este de los Estados Unidos.

**Logros:**

- Se implementó y cumplió con la capacitación en temas de seguridad en forma continua.
- Mejora del correcto uso de los equipos para el muestreo de hidrocarburos.
- Se implementó un cronograma de capacitación obligatorio en terminales para los inspectores de forma anual.
- Se mejoró e implementó el sistema MSDS on-line para los inspectores en todas las oficinas de la Costa Este de los Estados Unidos.
- Se adecuaron los formularios para un rápido acceso a la información por parte de los inspectores.
- Instalación de nuevos formatos para la elaboración y actualización de la información de los inspectores en todas las oficinas de la Costa Este de los Estados Unidos.

**c) Amspec Services LLC en Linden, New Jersey**

Empresa de servicios de inspección de hidrocarburos y sus derivados en todo los EE.UU., el Caribe y América Latina.

Fecha: Desde agosto 2009 a julio 2011

Inspector de Hidrocarburos:

- Disminuir los tiempos de respuesta para la carga y descarga de los tanques de tierra, barcazas y/o barcos.
- Mejorar la forma de toma de muestras de los hidrocarburos.
- Medir la cantidad del hidrocarburo y su temperatura, tanto en los tanques de tierra como en barcazas y/o barcos; y calcular la cantidad del producto.

- Afinar el entrenamiento a los nuevos inspectores tanto en lo teórico como lo práctico (en el campo).
- Hacer el seguimiento al desempeño de los nuevos inspectores después de terminado el entrenamiento.
- Perfeccionar el desempeño de las labores como inspector en terminales con reglas y normas muy específicas, al momento de carga y descarga de los productos.

**Logros:**

- Se optimizó los tiempos de respuesta para la carga y descarga de los tanques de tierra, barcazas y/o barcos.
- Se implementaron técnicas para la toma de muestras de los hidrocarburos y productos químicos.
- Se llevo a cabo métodos para la buena medición del hidrocarburo y su temperatura, tanto en los tanques de tierra como en barcazas y/o barcos; y así conseguir un mejor cálculo de la cantidad del producto.
- Mejora continua del entrenamiento a los nuevos inspectores tanto en lo teórico como en el campo.
- Se corrigió los tiempos de entrenamientos de los nuevos inspectores, para poder promoverlos al término del entrenamiento.
- Se perfecciono el desempeño de las labores como inspector en terminales con reglas y normas muy específicas, al momento de la carga y descarga de los productos.

**d) Saybolt Core Laboratories en Linden, New Jersey**

Ubicados en las principales provincias productoras de petróleo y sus derivados, Saybolt ofrece servicios de análisis a grandes, nacionales, e independientes empresas petroleras del mundo.

Fecha: Desde enero 2008 a agosto 2009

Inspector de Hidrocarburos:

- Llevar acabo técnicas para la mejor respuesta en la carga y descarga de los tanques de tierra, barcazas y/o barcos.
- Implementar técnicas para la toma de muestras de los hidrocarburos, productos químicos y carbón.

- Poner en funcionamiento métodos para la buena medición del hidrocarburo y su temperatura, tanto en los tanques de tierra como en barcazas y/o barcos; y así conseguir un mejor cálculo de la cantidad del producto.
- Corregir la forma del entrenamiento a los nuevos inspectores tanto en lo teórico como en el campo.

**Logros:**

- Se llevó a cabo nuevas técnicas para la mejor respuesta en la carga y descarga de los tanques de tierra, barcazas y/o barcos.
- Se implementó técnicas realistas para la toma de muestras de los hidrocarburos, productos químicos y carbón.
- Se puso en funcionamiento métodos mejorados para una buena medición del hidrocarburo y su temperatura, tanto en los tanques de tierra como en barcazas y/o barcos; y así conseguir un mejor cálculo de la cantidad del producto.
- Se corrigieron las técnicas de entrenamiento a los nuevos inspectores tanto en lo teórico como en el campo.

**1.2 Experiencia más significativa**

La experiencia adquirida en Amspec Services LLC en Linden, New Jersey, ha sido la más satisfactoria de la carrera, ya que es una mezcla de lo aprendido como Inspector de Hidrocarburos y el poder impartir los conocimientos adquiridos en los terminales del área de New York a los inspectores nuevos de hidrocarburos. La adquisición de nuevos conocimientos y materiales que ayudaron para poder compartir lo importante que son los equipos de protección, la seguridad tanto en los terminales como en el desempeño del trabajo y el cuidado de la salud como la del medio ambiente. Tanto así, que un gran logro fue el aprender como poder interactuar y capacitar personal de inspectores que no se encontraban en el área de New York, utilizando la tecnología con el programa de MSDS online.

Aparte de las capacitaciones, en los terminales del área de New York que se debían programar una vez al año, estaba la elaboración de los formularios para un rápido acceso a la información de los inspectores.

Como la implementación de nuevos formatos para la elaboración y actualización de los inventarios que contienen toda la información de los equipos, así como las calibraciones de los mismos, en todas las oficinas de la Costa Este de los Estados Unidos, para que en el momento de las auditorías internas como externas sean de fácil acceso.

El aprendizaje es constante, ya que se presentan nuevas situaciones en la que hay que aplicar los conocimientos adquiridos como los nuevos equipos que resuelven la mejora de tiempos que antes eran inimaginables y que hoy en día se pueden concretar.

Como logro principal, se puede mencionar la mejora e implementación del sistema MSDS on-line para los inspectores de hidrocarburos tanto en la oficina de New York como en todas las otras oficinas de la costa este de los Estados Unidos, que permitió a que todos los inspectores estén actualizados y con los conocimientos, en tiempo real, en los temas de la Normas API y la seguridad.

## **CAPÍTULO II**

### **CONTEXTO EN EL QUE SE DESARROLLÓ LA EXPERIENCIA**

#### **2.1 Presentación**

Durante más de treinta años, AmSpec Services LLC ha analizado y medido, de forma independiente y precisa hidrocarburos y sus derivados en los Estados Unidos, el Caribe, América Latina y en todo el mundo.

AmSpec Services LLC se dedica a brindar un servicio de calidad que supera las expectativas de sus clientes. La Compañía y sus empleados se esfuerzan por lograr el más alto grado de desempeño de calidad, lo cual se logra a través de sistemas claros y bien documentados, la capacitación adecuada, las calificaciones y experiencia de los empleados, y la mejora continua de todas las operaciones.

AmSpec Services LLC está certificada con la norma ISO 9001 bajo el ámbito de la "Prestación de Servicios de Inspección y Laboratorios de Hidrocarburos y sus derivados".

AmSpec Services LLC es miembro y participante activo de la International Federation of Inspection Agencies (IFIA), de la Grain and Feed Trade Association (GAFTA), aprobada como Public Gaugers por la US Customs and Border Protection, el Department of Homeland Security, y es miembro de la American Society for Testing and Materials (ASTM) y de la American Petroleum Institute (API).

La membresía y la participación en estas organizaciones de la industria requieren que la compañía revise, mejore y mantenga la calidad y eficiencia de todos los protocolos operacionales y de estandarización. El personal de inspección de la Compañía está obligado a completar ciertos programas de certificación para cumplir con los estándares de excelencia.

## **2.2 Características**

Entre las principales características de la empresa, se pueden mencionar las siguientes:

- AmSpec se enorgullece de ofrecer servicios de inspección profesional y confiable a sus clientes, contando con un amplio personal de inspectores altamente capacitados y motivados.
- Con oficinas en los Estados Unidos y en todo el mundo, AmSpec puede proporcionar servicios de inspección en casi cualquier parte del mundo con la misma calidad y fiabilidad que los clientes esperan de la empresa.
- Ofrece una amplia gama de servicios de campo para satisfacer las necesidades de los clientes, centrándose en inspección de hidrocarburos y sus derivados.
- Todos estos servicios son realizados por el personal de inspección de campo altamente capacitado, aprobado por IFIA. Los servicios de inspección independientes ayudan a mejorar el negocio reduciendo el riesgo, y garantizando la integridad y calidad del producto de acuerdo con las especificaciones del cliente.
- Las instalaciones de AmSpec, en los Estados Unidos y en todo el mundo, tienen la capacidad de realizar una amplia gama de análisis sobre una multitud de productos, incluyendo biocombustibles, petróleo, productos petroquímicos y agrícolas.
- El personal de laboratorio altamente capacitado y los laboratorios de última generación aseguran que los análisis se realicen con el más alto nivel de calidad, precisión y exactitud.
- AmSpec Services se enorgullece de superar las expectativas del cliente al proporcionar una sólida ciencia analítica, una calidad de pruebas sin igual y un excelente servicio al cliente.

- Se ha instituido un sistema de control de calidad completo en constante evolución para garantizar la integridad analítica.
- El programa se basa en la norma ISO 9001: 2008 y otros estándares nacionales e internacionales de calidad. Abarca una serie de actividades que les permiten alcanzar y mantener altos niveles de precisión y competencia.
- Cubre todas las fases del proceso de pruebas de laboratorio, desde el manejo de muestras, validaciones de rendimiento de instrumentos hasta la generación de certificados.
- AmSpec cumple estrictamente con los estándares y directrices de las Normas API, ASTM e IFIA.
- También participa, activamente, en los programas de verificación cruzada entre laboratorios de ASTM y otros programas administrados por el cliente regional.

### 2.3 Misión y visión

A continuación, se presenta la misión y visión de AmSpec Services LLC, información que ha sido proporcionada por la propia empresa.

- a) **Misión:** Conseguir los objetivos de calidad relacionados con la prestación de servicios que son: la precisión y la exactitud de la medición, la puntualidad de los servicios y de conformidad con la normativa de la Aduana, Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Department of Transportation (DOT) y con las prácticas de la industria.
  
- b) **Visión:** Lograr satisfacer las necesidades y expectativas de los clientes; cumplir con la industria y los requisitos reglamentarios, seguir los más altos estándares de profesionalismo e integridad, y la mejora continua de la calidad; y así lograr la mejor calidad en su clase y conseguir la satisfacción del cliente.

### 2.4 Estructura orgánica

AmSpec Services LLC tiene una estructura orgánica extremadamente compleja, ya que cuenta con una gama de oficinas a lo largo

de los Estados Unidos y el Mundo, tal como lo podemos apreciar en la Fig. 1, se ha tratado de enfocar en las áreas (oficina de New York) que están involucradas directamente con la formación, inducción y capacitación de los inspectores de hidrocarburos.

### **2.5 Puesto desempeñado**

En AmSpec Services LLC, el puesto desempeñado fue de Supervisor de Capacitación y Seguridad para Inspectores de Hidrocarburos, que involucraba el formar y capacitar en el uso de procedimientos y técnicas estándares (Normas API) a los inspectores en la oficina de New Jersey; entrenarlos en el correcto uso de los equipos para el muestreo de hidrocarburos; elaborar programas de inducción en terminales para los inspectores; la elaboración de nuevos formatos y formularios para un rápido acceso a la información e implementar el sistema MSDS on-line en todas las oficinas de AmSpec Services de la Costa Este del país.

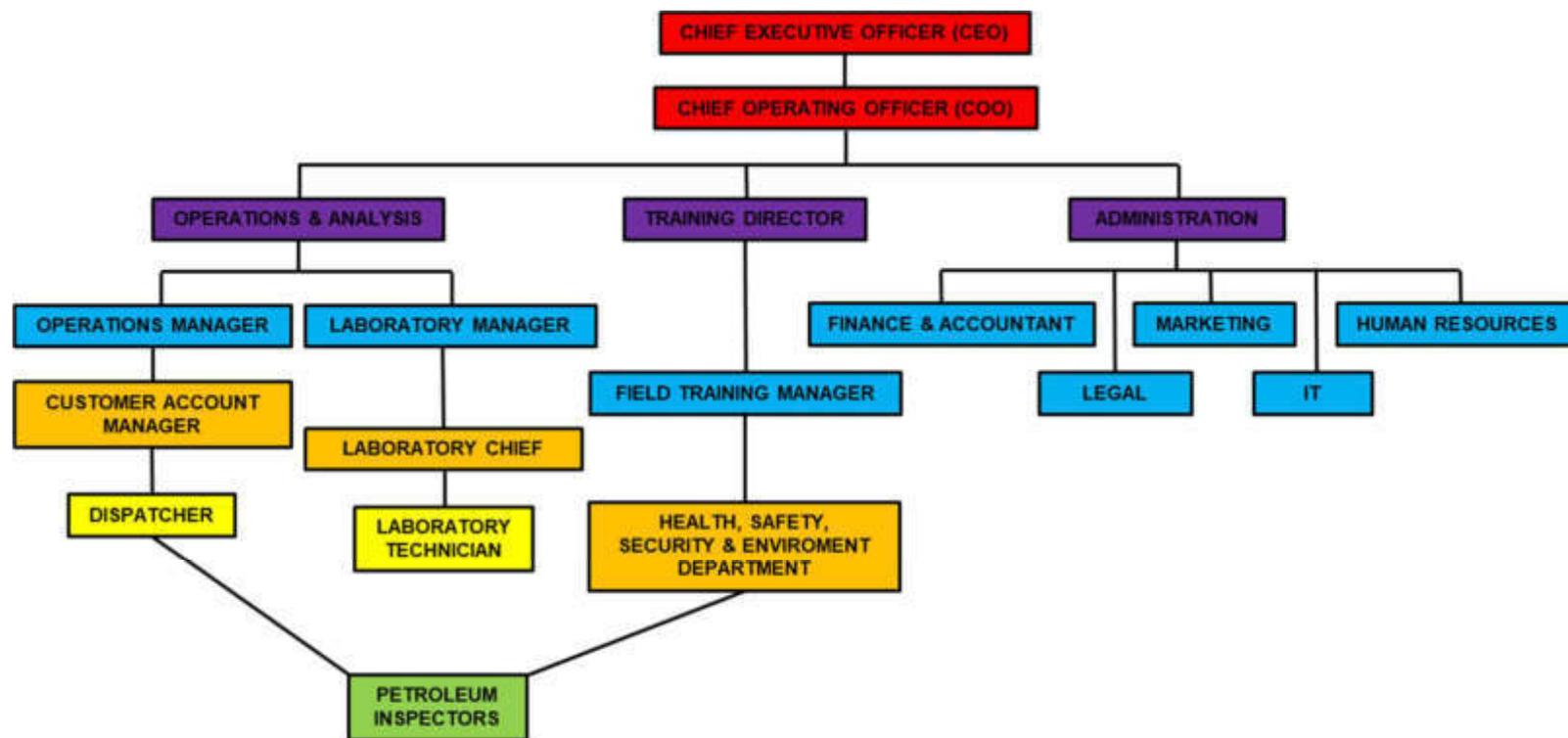


Figura 1. Estructura Orgánica de AmSpec Services LLC  
Fuente: AmSpec Services LLC

## CAPÍTULO III

### APLICACIÓN PROFESIONAL

#### 3.1 Definición del problema

El problema radica en las deficiencias del Área de Operaciones, que han sido identificadas por auditorías de clientes importantes de Amspec Services LLC, en que la mayoría de los problemas se presentaron en el Departamento de Capacitación, Seguridad y Control de Equipos (tal como se muestra en la figura 2).

Los problemas tales como la inadecuada capacitación e inducción de los inspectores, algo que fue muy evidente en los nuevos inspectores que no tenían ni idea muchas veces de lo que hacían. En el inicio, de un total de entre 43 a 48 inspectores, el 55.5% estaba mal capacitado, que trajo como consecuencia el bajo desempeño de ellos, en la mayoría de los casos eran solo inspectores de muestreo, que trajeron como resultado la insatisfacción del cliente. Así también, se tuvo un considerable número de accidentes en el campo, tales como derrames de productos, resbalones, caídas, golpes, etc. El índice de frecuencia de accidentes al empezar el proyecto era de 37 accidentes cada 200,000 H-H en el año 2011.

$$IF = \frac{30 \times 200,000}{162,000} = 37.03 \sim 37$$

# inspectores: 45, H-H:  $72 \times 50 \times 45 = 162,000$

También la falta de organización y administración de formularios para el seguimiento de la capacitación oportuna tanto del trabajo cotidiano como de seguridad.

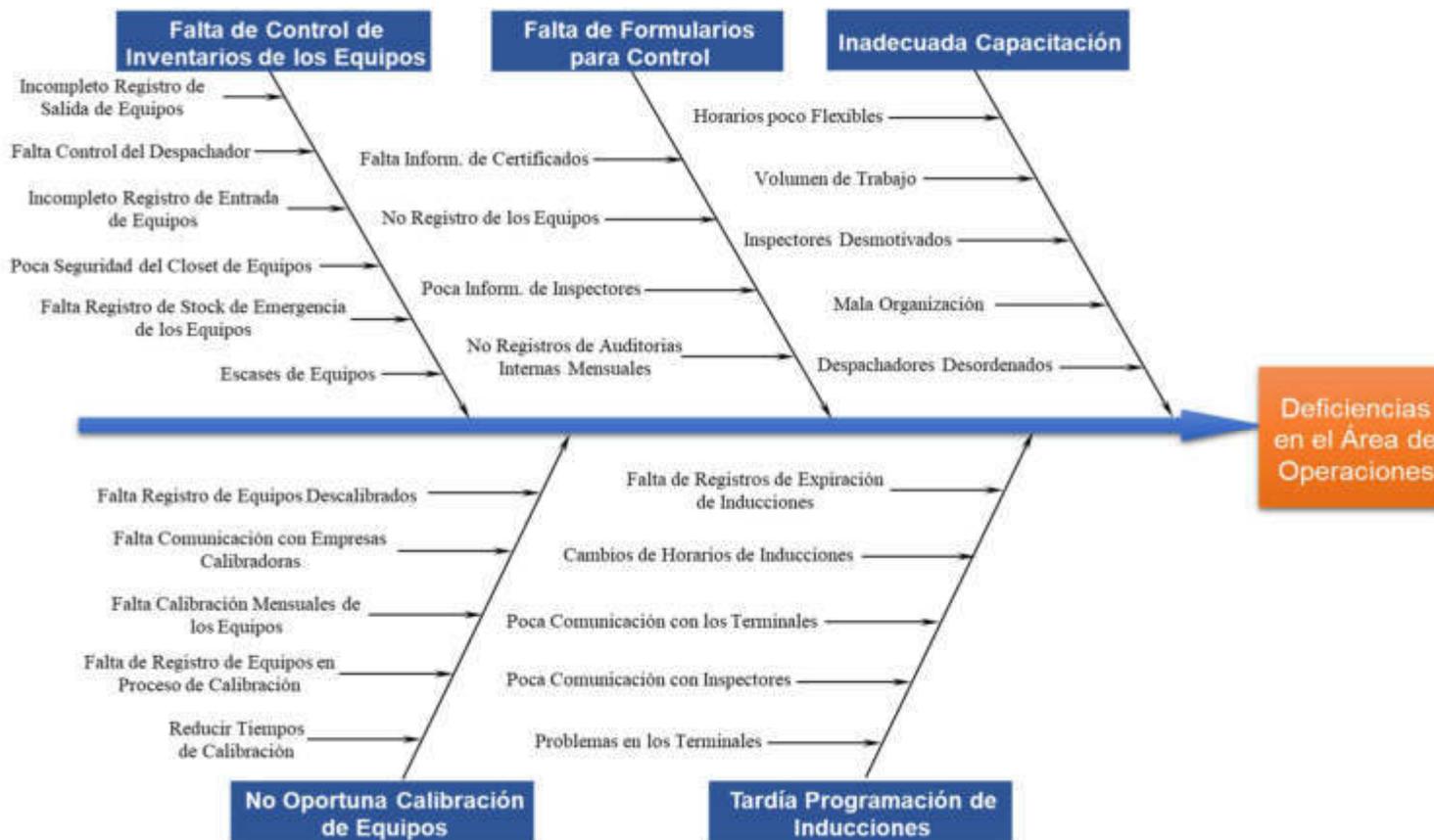


Figura 2. Diagrama de Espina de Pescado (Causa - Efecto).  
 Causas de la Deficiencias en el Área de Operaciones  
 Elaboración: el autor

El tardío control de la programación de las inducciones en los terminales que habilita a los inspectores para su ingreso y realización de los trabajos, trayendo como consecuencia que los inspectores programados para el trabajo no puedan ingresar a tiempo a un terminal.

La falta de control del inventario de los equipos usados por los inspectores, tanto como los de uso personal como los utilizados para trabajos especiales y de forma grupal.

Otro problema es la no oportuna calibración de los equipos utilizados por los inspectores (por ley una vez al año) o en el caso de necesitar el cambio del equipo por uno nuevo, y desechar o enviar a mantenimiento al equipo dañado.

Dentro de las herramientas de Ingeniería Industrial que se utilizaron en el presente proyecto, está el Diagrama de Gantt, contribuyendo a programar el proyecto de mejora a lo largo del tiempo que duro. Otra herramienta importante que se utilizó fue el Diagrama de Ishikawa (causa – efecto) o más conocido como espina de pescado, por su forma y ubicación de los datos, que ayudó a visualizar y descubrir todas las causas del problema principal. Sin embargo, la herramienta sencilla que más se utilizó fue la Lista de Chequeo (Check List), esta herramienta ha permitido dentro del proyecto recopilar y verificar información en tiempo real, de detalles y datos, los cuales llevaron a implementar un control de procesos de manera efectiva. La Lista de chequeo fue sumamente conveniente, porque ayudó a realizar el seguimiento, las mediciones de los procesos de calibración e inventario, y ordenamiento de la información a lo largo del proyecto.

### **3.2 Diseño de la solución**

Se sabe bien que frente a un problema industrial existe una solución industrial, y para llegar a ella se debe recopilar información y utilizar herramientas para el diseño de la solución (planificación) que permitan tener un orden, una plantilla, un esquema, etc. a seguir, que permite visualizar la solución deseada (tal como se muestra en la fig. 3).



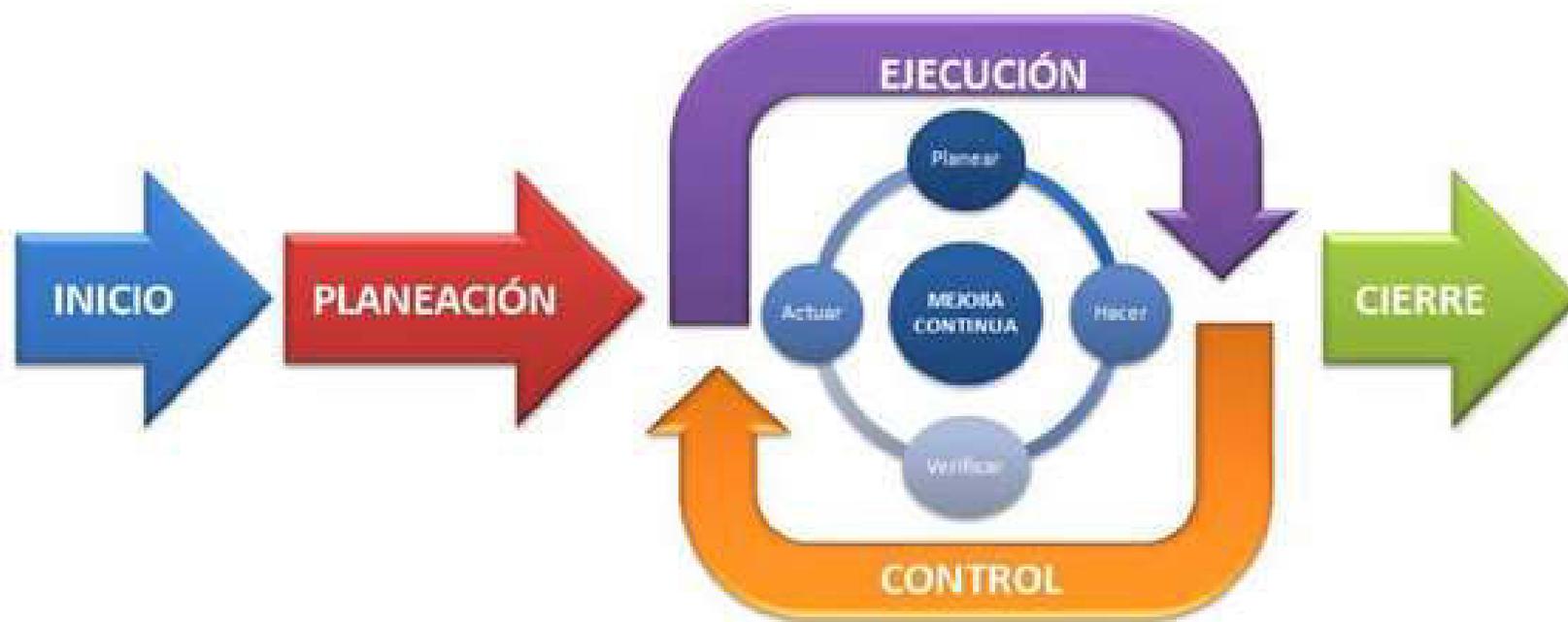


Figura 4. Método del “Ciclo de la Vida”  
Elaboración: el autor

Al inicio del proyecto, se decidió utilizar la metodología conocida como el Ciclo de la Vida, pero agregándole el Espiral de Mejora continua o conocido como PHVA en la Ejecución y el Control, para que de esa forma se pueda tener un Feedback constante (tal como se aprecia en la fig. 4).

Se supo qué procesos deberían de seguir, en este caso la implementación de un programa de capacitación a los inspectores de hidrocarburos, una mejora en la programación de las inducciones en los terminales, la creación de nuevos formularios de control, un dedicado control de inventarios y una oportuna calibración de equipos.

En lo que concierne a la etapa de planificación, se pudo definir las acciones que se debían seguir, es decir, los objetivos:

- Implementar el Programa de Capacitación de Normas API y MSDS online,
- Creación de Formularios de Control,
- Mejorar el Programa de Inducciones en los Terminales,
- Implementar un Mejor Control de los Inventarios, y
- Mejorar el Sistema para la Calibración de los Equipos.

En el Programa de Capacitación de Normas, se utilizaron como parámetros de control, los siguientes indicadores:

- Indicador de cumplimiento al empezar el proyecto era de 47.3% en el año 2011.

$$ICp = \frac{142 \times 100\%}{305} = 47.3\%$$

# actividades ejecutadas:  $(8 \times 9) + (14 \times 5) = 142$

# actividades programadas:  $(20 \times 9) + (25 \times 5) = 305$

- Indicador de cobertura al empezar el proyecto era de 48.8% en el año 2011.

$$IC = \frac{22 \times 100\%}{45} = 48.8\%$$

# inspectores capacitados: 22

# inspectores programados: 45

Así también, se determinó que la aprobación de las evaluaciones del Programa de Capacitación de Normas fuera de una nota mayor al 80%.

En el Programa de Capacitación del MSDS online, se utilizaron como parámetros de control, los siguientes indicadores:

- Indicador de cumplimiento al empezar el proyecto era de 44.4% en el año 2011.

$$ICp = \frac{200 \times 100\%}{450} = 44.4\%$$

# actividades ejecutadas:  $20 \times 10 = 200$

# actividades programadas:  $45 \times 10 = 450$

- Indicador de cobertura al empezar el proyecto era de 44.4% en el año 2011.

$$IC = \frac{20 \times 100\%}{45} = 44.4\%$$

# inspectores capacitados: 20

# inspectores programados: 45

Así también, se determinó que la aprobación de las evaluaciones del Programa de Capacitación del MSDS online fuera de una nota mayor al 80%.

En la Implementación de Formularios, se utilizó como parámetro de control, el Índice de aceptación, que fue medido con las personas que utilizaban los formularios (personas del área de capacitación, despachadores de trabajo, jefes de departamento, encargados de cuentas y gerentes). Al inicio del proyecto, enero del año 2012, se hizo el cálculo del Índice de aceptación:

- Índice de aceptación al empezar el proyecto era de 30%.

$$IA = \frac{6 \times 100\%}{20} = 30\%$$

# personas que aceptan los formularios: 6

# total de personas que utilizan los formularios: 20

En el Programa de Inducciones, el cual se desarrollaba entre 6 terminales, se utilizó como parámetro de control los siguientes indicadores:

- Indicador de cumplimiento al empezar el proyecto era de 47.6% en el año 2011.

$$ICp = \frac{109 \times 100\%}{229} = 47.6\%$$

# actividades ejecutadas:  $(5 \times 6) + (15 \times 5) + (1 \times 4) = 109$

# actividades programadas:  $(5 \times 6) + (39 \times 5) + (1 \times 4) = 229$

- Indicador de cobertura al empezar el proyecto era de 46.7% en el año 2011.

$$IC = \frac{21 \times 100\%}{45} = 46.7\%$$

# inspectores capacitados: 21

# inspectores programados: 45

Con el fin de implantar un mejor Control de Inventarios se utilizó como parámetro de control, el Indicador de equipos dañados y perdidos, que fue utilizado para calcular los problemas que se tenían con los Thermoprobe (Termómetros Digitales). Al inicio del proyecto, en enero del año 2012, se hizo el cálculo del Indicador de equipos dañados y perdidos (IEDP):

- Indicador de equipos dañados y perdidos al empezar el proyecto era de 7.7%.

$$IEDP = \frac{4 \times 100\%}{52} = 7.7\%$$

# Thermoprobe dañados y perdidos:  $3 + 1 = 4$

# Total de Thermoprobe: 52

Este indicador se trató de mejorar adquiriendo más equipos (total de 60 en diciembre del año 2012) y concientizando a los inspectores a ser más cuidadosos con ellos.

Y para tratar de mantener los equipos, en buen estado, se siguió el Sistema de calibración de equipos y se utilizó como parámetro de control el Indicador de equipos descalibrados, que fue utilizado en los

Thermoprobe (Termómetros Digitales). Al inicio del proyecto, en enero del año 2012, se hizo el cálculo del Indicador de equipos descalibrados (IED):

- Indicador de equipos descalibrados al empezar el proyecto era de 5.76%.

$$\text{IED} = \frac{3 \times 100\%}{52} = 5.76\%$$

# Thermoprobe descalibrados: 3

# Total de Thermoprobe: 52

Este indicador se mejoró con un incremento de equipos (total de 60 en diciembre del año 2012), lo que ayudó a obtener un mejor stock para cuando surgiera algún percance.

Cuando se llegó a la fase de ejecución, allí se empezó a sentir las dificultades, porque no se olvide que es complejo “administrar personas”. Se notó que en un principio la idea de llevar un programa no les causaba mucho entusiasmo, lo veían como ellos decían “una pérdida de tiempo”.

Posteriormente, se fue notando cambios estupendos en el proyecto y los avances fueron significativos y se vieron reflejados, en ellos mismos, en su actitud de sentir que incrementaban sus conocimientos en temas de seguridad. Esto se pudo comprobar con las calificaciones que obtenían en los exámenes escritos de las normas, así como los exámenes del MSDS online. No solo se conformaban con aprobar el curso (80%), sino de obtener buenas notas.

Y por último, en el cierre se formalizó con la aceptación de los resultados, en este caso: La implementación del programa de capacitación a los inspectores de hidrocarburos, una mejora en la programación de las inducciones de seguridad en los terminales, la creación de nuevos formularios de control, un dedicado control de inventarios y una oportuna calibración de equipos, culminando de manera ordenada en cada etapa de la planificación.

Dentro de los objetivos, el principal era lograr sensibilizar al inspector de hidrocarburos en llevar el programa de capacitación de Normas y el de MSDS online, comprendiendo que era importante tanto para él como para la organización.

Y en los objetivos secundarios, “poner en orden la casa”, estos son la creación de nuevos formularios de control, establecer un adecuado control de inventarios de los equipos y permanecer en constante verificación de la calibración de los mismos; es decir, que los inspectores se involucren no solo en realizar su trabajo, sino cuidar de las herramientas y equipos que usan a diario, considerando que al ser utilizados con alta frecuencia son como “una extensión de ellos mismos”.

En otras palabras, la solución a los problemas que presentaba la empresa se podían resolver con un adecuado plan de capacitación, una buena implementación de formularios correctivos y actualizados, una programación precisa de inducciones en los terminales, un dedicado control de inventario y una oportuna calibración de equipos.

### **3.2.1 Capacitación de inspectores**

La formación de los inspectores de hidrocarburos es un elemento garantizado para la mejora y la seguridad de ellos, por tal razón será uno de los puntos clave en la mejora del área, porque un inspector de petróleo trabaja en todos los pasos de la cadena de suministros de gasolina (ver fig. 5) y en todos, se debe trabajar respetando las Normas. Es por eso que se creó un programa de capacitación para los inspectores nuevos y que, al mismo tiempo, sirva para reforzar y actualizar los conocimientos de los inspectores antiguos, y también a los jefes inmediatos, basados en los estándares de las Normas ASTM (American Society for Testing and Materials) y del Manual de Normas API (American Petroleum Institute).

La capacitación a los inspectores de hidrocarburos se realizó tomando en cuenta si eran nuevos, inspectores de barcaza o inspectores de barcos. Los temas son tomados del examen para certificación

del IFIA, y de los cuales se desarrollaron preguntas para hacer las evaluaciones y determinar el conocimiento de los inspectores. Estos 9 cursos entrenaron a los inspectores, en los temas necesarios para desempeñarse apropiadamente y con base en las Normas del ASTM y principalmente del API (ver Anexo 14).

En el caso de los inspectores nuevos, se les capacitó para que obtuvieran un conocimiento básico en la industria en los siguientes cinco temas:

**1) La Seguridad.** Objetivos del tema: las prácticas de trabajo seguro; una mejor comprensión (de por qué) “hacemos lo que hacemos”; un buen personal capacitado en el campo; la reducción de errores; la confianza de los clientes; la conducta profesional y el buen rendimiento; el aumento de la satisfacción del trabajo; la eliminación de incidentes / accidentes / reclamos; la mejora de la imagen de la empresa.

**2) Ética & Reducciones.** Objetivos del tema: sensibilizar a los empleados sobre los principios éticos; ayudar a los empleados a tomar decisiones comerciales correctas y éticas; a aclarar los procedimientos en caso de que surja un problema ético; examinar los escenarios de negocios y proporcionar directrices claras a los empleados; garantizar que todos los empleados entiendan que las posibles consecuencias penales, civiles y administrativas de la falta de conformidad, tanto para la empresa como para el empleado serían graves; garantizar que los empleados entiendan que el incumplimiento dará lugar a una acción disciplinaria interna, incluida la terminación; promover el debate y desarrollar una comprensión compartida de cómo actuar en el lugar de trabajo ético.

**3) Muestreo.** Objetivos del tema: aprender y comprender los capítulos 8.1, 8.2 y 17.1 del API; saber del uso de la cuerda y plomada de muestreo; conocer cómo utilizar el muestreador de canastilla; conocer cuando utilizar el muestreador de zona, el muestreador de Cucharón o el muestreador de Sistema Cerrado; en qué lugares utilizar los UTI / MMC; y conocer cómo obtener todos los tipos de muestra.

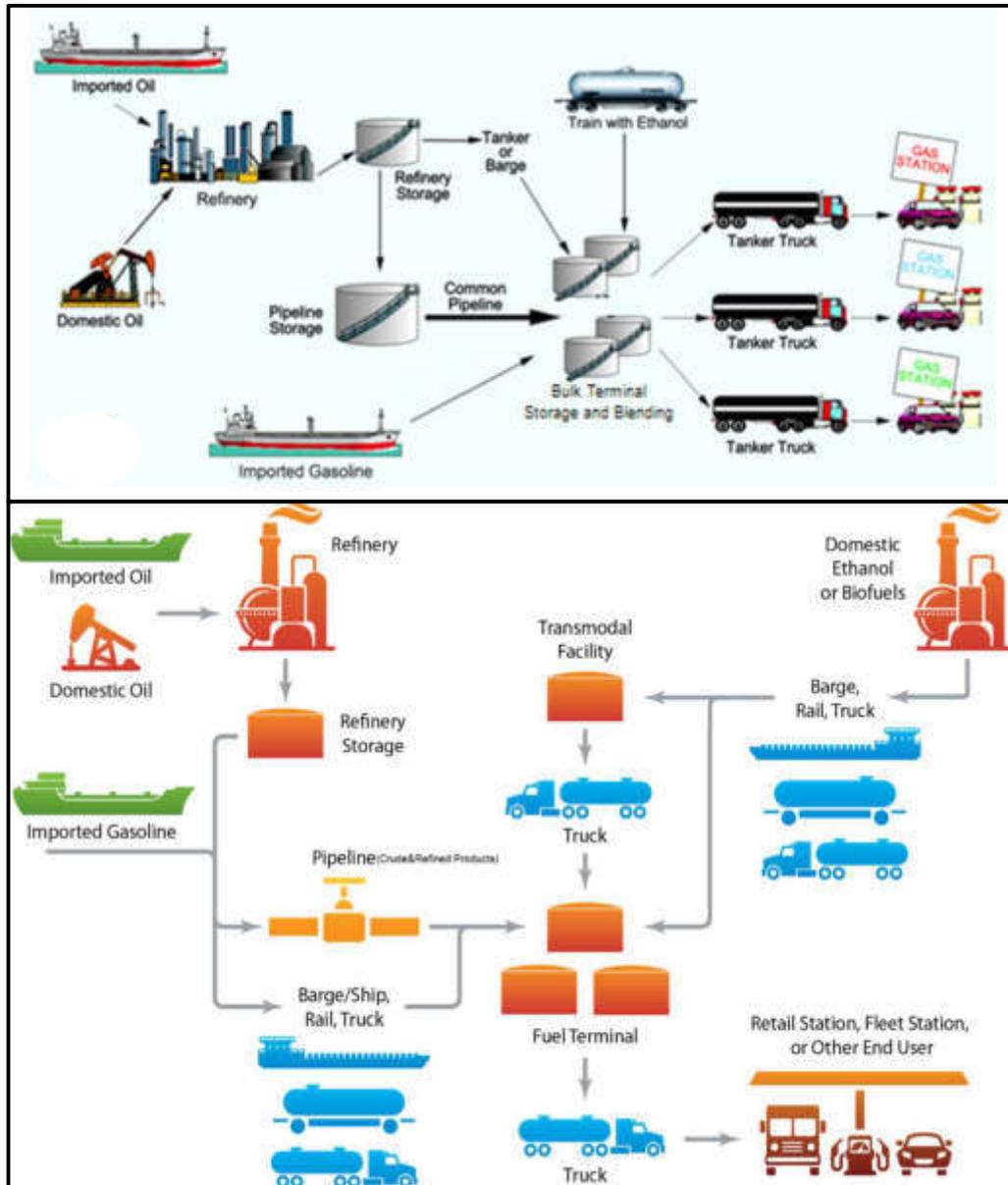


Figura 5. Resumen de la Cadena de Suministro de Gasolina  
Fuente: AmSpec Services LLC

**4) Temperatura.** Objetivos del tema: aprender y comprender los capítulos 7, 17.1 & 17.2 del API; saber por qué es necesario tomar con exactitud la temperatura; conocer los diferentes tipos de equipos; aprender la forma de calibración de los equipos; conocer los tiempos de inmersión de los equipos; y estar al tanto de las consecuencias financieras del cliente.

**5) Medición & Medidas.** Objetivos del tema: aprender y comprender los capítulos 3.1A, 17.1 y 17.2 del API; conoceremos lo que es la medición, no solo tomar una medida, no solo el método correcto, sino también ver algunos de los problemas y las situaciones que puedan surgir; aprender cómo la medición se relaciona con los volúmenes; y aprender qué equipo utilizar en determinada situación.

Y en los casos de inspectores de barcaza o de barcos se les reforzó los cinco temas básicos, y se les capacitó en cuatro temas más para que tuvieran un conocimiento más amplio en los temas de movimientos de productos. En ambos casos, los conocimientos son iguales, y lo que varía es la capacidad de la embarcación, documentación y el llenado de documentos. Los cuatro temas adicionales son los siguientes:

**6) ROB & OBQ.** Objetivos del tema: aprender y comprender los capítulos 17.1 y 17.4 del API; aprender a inspeccionar visualmente los tanques de las barcasas y barcos; conocer cómo revisar los tanques de bunker; control de los espacios vacíos y de lastre; aprender cómo hacer la inspección ROB & OBQ en barcasas y barcos; conocer la condición de tubería del barco o barcaza; y la revisión de las líneas de caída y drenaje.

**7) Verificación de la Línea.** Objetivos del tema: aprender y comprender el capítulo 17.6 del API; conocer los tres estados de la línea (lleno, parcialmente lleno y vacío); métodos de comprobar el estado de la línea (llenado de la línea y desplazamiento de la línea)

**8) Cálculos & Reportes.** Objetivos del tema: aprender y comprender los capítulos 11 y 12 del API; Conocer cómo uniformar los sistemas de medida utilizando las tablas correctas de conversión (Tabla 6A o 54A, 6B o 54B);

saber con qué volumen se está trabajando (galones, barriles o metros cúbicos) y aprender a convertir de un volumen a otro; saber llevar una lista de los tiempos de todo lo que sucede durante la carga, descarga o transferencia de producto; hacer los cálculos de los tanques de tierra, los tanques de la nave, hacer la comparación de ambos y al final un reporte con todas las cantidades.

**9) Conocimientos generales de la industria.** Objetivos del tema: aprender acerca de todo lo que involucra trabajar sobre una nave y cómo el inspector se debe comportar a bordo para no dejarse sorprender; conocer acerca del sistemas de gas inerte que se utiliza a bordo de la nave; aprender a solicitar y conocer la documentación adecuada acerca del lavado de los tanques, si lo que estamos supervisando es una carga de producto en la nave; preguntar acerca de qué bombas y sistemas de tuberías se utiliza en la nave; solicitar la documentación adecuada del control del combustible y sistemas de combustible (Bunkers) antes y después de la carga o descarga de la nave; aprender a hacer una revisión visual de los tanques de lastre; etc.

Todos los temas serán evaluados por el instructor a cargo. Si el inspector desapruueba la evaluación (menos del 80%), tendrá que ser programado para otro día para que rinda nuevamente la evaluación (ver Anexo 15).

A la par, se utilizó el sistema de capacitación en línea administrado por MSDS online (ver Anexos 3 y 4). La biblioteca está formada por 10 cursos adquiridos. Los cursos se asignaron generalmente uno por mes, comenzando en mayo del año 2012, aunque pueden añadirse otros adicionales según sea necesario para abordar problemas de capacitación graves que resulten de problemas experimentados en el campo o en la oficina (ver Anexo 6).

La asignación de cursos, el seguimiento de la realización de los cursos y la administración general se manejaron de la siguiente manera: COSTA ESTE (Boston, New Haven, New York,

Philadelphia, Virginia, Bahamas, Florida, New Orleans, Baton Rouge) por Joan Carrillo, Supervisado por Jorge Piñón. GOLFO/COSTA OESTE (Lake Charles, Port Arthur, Houston, Texas City, Corpus Christi, Los Ángeles) por Jimmy Cormier, Supervisado por Chris Land (ver Anexos 1 y 2).

Los informes mensuales de cumplimiento fueron preparados para su revisión por la gerencia. Se requiere la participación de los gerentes de todas las oficinas para asegurar el cumplimiento en el Área. Los encargados se pusieron en contacto con cada una de las oficinas para asegurarse de que todos los empleados estén registrados en el sistema y puedan iniciar sesión. Para ayudar en este esfuerzo se necesita una lista de los inspectores actuales entregada por la gerencia (ver Anexo 5).

Al finalizar cada curso y aprobarlo (con 80% o más), los inspectores recibían un certificado del tema asignado (como en la fig. 6). En muchos de los casos, los inspectores no estaban de acuerdo con su calificación, así que podían llevar el curso las veces que quisieran y tener un mejor conocimiento del tema.

### **3.2.2 Implementación de formularios**

La creación de nuevos formularios para el control más dedicado de las actividades de los inspectores fue clave, porque con ello se pudo ordenar de manera rigurosa cualquier falencia de ellos y al mismo tiempo ayudar a los despachadores de trabajo para que no seleccionaran inspectores que no estaban habilitados en los terminales y sepan cuándo era su siguiente capacitación.

Uno de los formularios más importante creado fue el que incluía todas las capacitaciones de seguridad en los diferentes terminales, que a pesar de que todos seguían las mismas normas de seguridad, cada terminal tenía sus reglas y formas de trabajar. En ese formulario también se incluía los certificados básicos que los inspectores requerían, como el Twic Card (ver fig. 7) y el Certificado IFIA (ver fig. 8), documentos importantes para todo inspector, en especial el TWIC Card porque sin este documento no se permite a los inspectores el ingreso a los terminales, por ser un documento



Figura 6. Modelo del Certificado de MSDS online  
Fuente: AmSpec Services LLC

obligatorio del gobierno. Otra de las cosas que se incluía en este formulario son las fechas de cuando toca realizar los exámenes de alcohol y drogas, el examen de benceno y la prueba de la máscara respiratoria (ver Anexo 8).

Otro formulario que se desarrolló fue el de actividades que podían desarrollar los inspectores en cada uno de los terminales, ya que los terminales debían aprobar si los inspectores estaban aptos para desarrollarlas. Por ejemplo, si los inspectores eran tomadores de muestras de productos negros y claros o solo de uno de ellos (ver Anexo 9).

Los siguientes formularios fueron desarrollados para llevar un mejor control de las auditorías internas mensuales a los inspectores. Estas auditorías consistían en la revisión de los equipos de uso personal, como los de seguridad y los de trabajo de campo. También debían contar con los certificados de los equipos y tenerlos a la mano. Otra de las cosas con que tenían que contar era con el cajón de seguridad donde guardaban las muestras. Luego de las auditorías se realizaba un informe de todos los inspectores y las condiciones en que mantenían sus equipos en sus autos (ver Anexo 10).

Y finalmente, se elaboraron formularios en los cuales llevábamos un registro de las licencias de conducir con sus fechas de expiración, de la compañía aseguradora de sus vehículos y del número de las matrículas de ellos. Se tuvo que tener esta información a la mano por que los terminales lo requerían para ciertos trabajos específicos (ver Anexo 11).

### **3.2.3 Programación de inducciones**

A partir de la creación del formato en el que se lleva un registro de las inducciones (capacitaciones de seguridad y forma de comportarse dentro de los terminales o refinerías), se pudo controlar eficientemente las fechas de expiración y coordinar directamente con los terminales las fechas de las inducciones. Muchas de ellas eran a veces una vez al mes como en otras, eran dos o tres por mes. Tal como se puede apreciar en el formulario (ver fig. 9), las inducciones que estaban al día se



Figura 7. Modelo del TWIC Card  
Fuente: AmSpec Services LLC



Figura 8. Modelo de Certificado IFIA  
Fuente: AmSpec Services LLC

marcan de un color claro, y las que estaban vencidas o por expirar de un color oscuro.

En el caso de que el inspector no tuviera la inducción o no hiciera trabajo en ese terminal o refinería se dejaba en blanco y se le colocaba N/A. Este formulario de inducciones se actualizaba cada semana y ayudaba a los despachadores de trabajo a elegir apropiadamente a los inspectores idóneos para cada trabajo (ver Anexo 8).

### **3.2.4 Control del inventario de equipos**

El control del inventario fue una de las correcciones importantes que se hizo en el departamento. Que, a pesar de tenerse un listado de los equipos, este control no se hacía correctamente. Así que se tuvo que mejorar los formatos y agregar unos cuantos, para el mejor ordenamiento de todo, ya que cada vez eran más inspectores y si no se tomaba acción esto se saldría de control.

Se empezó utilizando un formato existente, La Lista de Verificación de Equipos de Campo, al que se le hicieron unas mejoras. Este formato para auditoría, que incluye un listado de todos los equipos de campo y seguridad que debe tener el inspector, es para ser llenado el primer día de trabajo del inspector cuando se le entrega los equipos de trabajo de campo y de seguridad. Esta lista debe ser actualizada cada vez que al inspector se le malograba algún equipo de campo o de seguridad.

A pesar de tener un formato que nos daba los números de serie de los equipos de los inspectores, se creó un listado de los equipos más importantes, con el nombre de todos los inspectores que lo utiliza y su número de serie, porque los terminales empezaron a solicitarlo, así como los auditores.

| <u>INSPECTORS</u>  | <u>B.A.S.E<br/>Bayway Exp.<br/>Date</u> | <u>Hess Bayonne<br/>Training Exp.<br/>Date</u> | <u>Hess Pt<br/>Reading<br/>Training Exp.<br/>Date</u> | <u>IMTT<br/>Training Exp.<br/>Date</u> | <u>KMI Training<br/>Exp. Date</u> | <u>Motiva<br/>Training<br/>Exp. Date</u> |
|--------------------|---|--|---|--|-----------------------------------|--|
| Acosta, Lenny      | 30/03/2013                              | N/A  | 21/06/2013  | 8/02/2013                              | 31/01/2013                        | CERTIFIED                                |
| Atanassov, Jivko   | N/A                                     | N/A  | N/A   | 17/10/2013                             | 16/10/2013                        | CERTIFIED                                |
| Bafico, Javier     | N/A                                     | 11/04/2013                                     | N/A   | 5/09/2013                              | 2/10/2013                         | CERTIFIED                                |
| Bhat, Ramchandra   | N/A                                     | 2/04/2013                                      | N/A   | N/A                                    | 11/09/2013                        | CERTIFIED                                |
| Borgono, Edgar     | N/A                                     | N/A  | 21/06/2013  | N/A                                    | 7/08/2013                         | CERTIFIED                                |
| Bueno, Wilson      | N/A                                     | 28/03/2013                                     | 21/06/2013  | 8/02/2013                              | 20/03/2013                        | N/A                                      |
| Campbell, David    | N/A                                     | 4/04/2013                                      | N/A   | N/A                                    | 16/10/2013                        | N/A                                      |
| Cantelmi, John     | N/A                                     | N/A  | N/A   | N/A                                    | 18/10/2012                        | N/A                                      |
| Cedro, Ernesto     | N/A                                     | N/A  | N/A   | 6/06/2013                              | 2/10/2013                         | N/A                                      |
| Cheatham, Kenneth  | N/A                                     | 17/10/2013                                     | N/A   | 7/12/2012                              | 16/10/2013                        | CERTIFIED                                |
| Cipriano, Frank    | N/A                                     | N/A  | N/A   | N/A                                    | 2/10/2013                         | N/A                                      |
| Cole, Ian          | N/A                                     | N/A  | N/A   | N/A                                    | N/A                               | N/A                                      |
| DeLuna, Carlos     | N/A                                     | N/A  | N/A   | N/A                                    | 2/10/2013                         | N/A                                      |
| Elmasry, Mohammed  | N/A                                     | N/A  | 7/11/2012   | 8/08/2013                              | 7/08/2013                         | N/A                                      |
| Estrada, Nelson    | N/A                                     | 22/06/2013                                     | N/A   | 9/05/2013                              | 15/05/2013                        | N/A                                      |
| Fabricatore, James | N/A                                     | N/A  | N/A   | N/A                                    | 11/09/2013                        | N/A                                      |
| Ferreira, Jose     | N/A                                     | 2/07/2013                                      | 28/06/2013  | 27/06/2013                             | 3/07/2013                         | CERTIFIED                                |
| García, Hector     | 30/03/2013                              | N/A  | 19/01/2013  | 10/10/2013                             | 20/03/2013                        | N/A                                      |
| García, Salvador   | 4/04/2013                               | 28/03/2013                                     | 25/01/2013  | 30/11/2012                             | 2/10/2013                         | CERTIFIED                                |
| Gonzalez, Pablo    | N/A                                     | 2/07/2013                                      | N/A   | 27/06/2013                             | 21/08/2013                        | N/A                                      |
| Ira, Constancio    | 21/05/2013                              | N/A  | N/A   | 23/05/2013                             | 1/04/2013                         | N/A                                      |
| Koncen, Andrew     | N/A                                     | N/A  | N/A   | 21/03/2013                             | 7/08/2013                         | CERTIFIED                                |
| Kraemer, John      | N/A                                     | N/A  | N/A   | N/A                                    | 2/10/2013                         | N/A                                      |
| Lane, Joshua       | N/A                                     | N/A  | N/A   | N/A                                    | N/A                               | N/A                                      |

**Figura 9. Parte del Formulario de Control de Inducciones**  
**Fuente: AmSpec Services LLC**

Los equipos listados fueron los MSA Altair-4 (ver fig. 10), monitores detectores de gases múltiples, que ayuda a los inspectores a mantenerse alejados de área peligrosa; los Woodback Thermometer (ver fig. 11), termómetros que ayudan al inspector a tomar las temperaturas de los tanques cuando fallan los equipos electrónicos; los Thermoprobe (ver fig. 12), termómetros electrónicos que hacen la medición de los diferentes productos; los NIST Thermometer (ver fig. 13), termómetros con los que se hacen las calibraciones diarias de los Thermoprobe, ya que los NIST Thermometers tienen un certificado de calibración por 5 años; los Tape of Innage and Outage (Ullage) (ver fig. 14), que sirven para la medición de la cantidad de producto en los tanques de tierra; los Hermetic UTI and MMC (ver fig. 15), que son los equipos que se utilizan para hacer las mediciones de temperatura y de la cantidad de producto en los barcos o barcasas; y los Self Contained Breathing Apparatus (SCBA) (ver fig. 16), que son los equipos utilizados para respiración artificial en zonas de trabajo muy contaminadas de gases peligrosos para la salud, tales como el CO y el H<sub>2</sub>S.

Todos estos formatos ayudaron a un mejor control de los equipos de trabajo y estar al tanto del estado en que se encuentran para tomar acción de manera inmediata y hacer los correctivos necesarios, es por ello que las actualizaciones se realizaban una vez a la semana (ver Anexo 12).

### **3.2.5 Calibración de equipos**

Este tema fue esencial, que a pesar de tener los formatos no se actualizaban los datos periódicamente. Es por esto que se decide calibrar los equipos en el periodo que establece la Norma API, ya que al tener calibrados a los equipos se pueden tener medidas exacta y con ello, mayor precisión en los cálculos de los productos.

Uno de los más importantes es el de la calibración anual de las cintas de medir personales que usan los inspectores, clave en los cálculos de los productos, se mejoró notablemente, ya que se optó por cambiar las cintas anualmente a todos los inspectores y evitar problemas de

calibración. Otro formato importante es el de la calibración anual de los termómetros electrónicos, realizado por la empresa que fabricó el equipo (WL Walker o Thermoprobe).

El siguiente formato, no menos importante, es donde se registra la calibración tanto de los UTI Hermetic como los MMC (equipos que se utilizan en los barcos), donde se calibra la confiabilidad de la cinta métrica del equipo (cm y pulgadas) y el dispositivo encargado de tomar la temperatura de los productos. En ambos casos, cinta métrica y la temperatura, son calibradas por la empresa fabricante (Honeywell Hermetic y MMC Corp.)

Otro formato que es actualizado cada año es donde se registra la temperatura del Woodback, termómetro usado en caso de emergencia si el termómetro electrónico fallara. En él se registran tres temperaturas (fría, ambiente y caliente).

El siguiente formulario sirve para hacer los controles mensuales de los equipos que utilizan los inspectores a diario. En él se registra la información de los equipos con sus números de serie y el estado en que se encuentran. Si fuera necesario cambiar el equipo se hace, se calibra y se actualizan todos los formularios.

Esta por de más decir que los formularios de control del MSA Altair 4, los UTI Hermetic y los MMC también se hacen mensualmente, para que no nos sorprenda un repentido deterioro de los equipos. Todos y cada uno de los formatos tiene una importancia para tener un control de los equipos (ver Anexo 13).

### **3.3 Ejecución de la solución**

El empezar los cambios necesarios no fue fácil, muchos estaban acostumbrados a trabajar de forma desordenada e improvisada, porque en las empresas que estuvieron antes había poco personal y eran fácil de manejar. Es cierto que cuando hablamos entre 43 y 48 inspectores las cosas cambiaron, y todo puede salirse de control.



**Figura 10. Modelo del Monitor MSA Altair-4**  
**Fuente: AmSpec Services LLC**



**Figura 11. Modelo del Woodback Thermometer**  
**Fuente: AmSpec Services LLC**



Figura 12. Modelo de los Thermoprobe  
Fuente: AmSpec Services LLC



Figura 13. Modelo del NIST Thermometer  
Fuente: AmSpec Services LLC

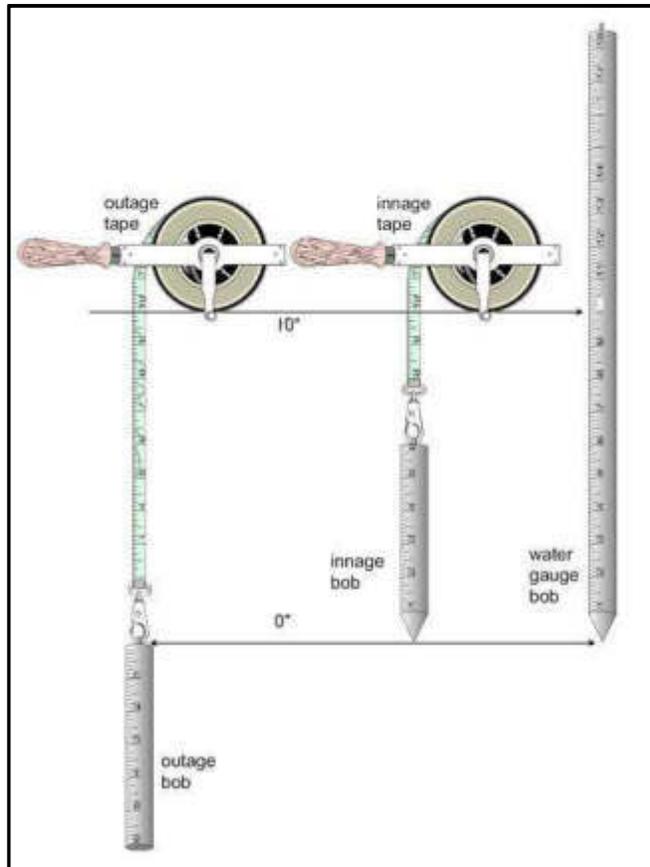


Figura 14. Modelo de los Innage Tape y Outage (Ullage) Tape  
Fuente: AmSpec Services LLC



Figura 15. Modelo de los Hermetic UTI y MMC  
Fuente: AmSpec Services LLC



Figura 16. Modelo del Self-Contained Breathing Apparatus (SCBA)  
Fuente: AmSpec Services LLC

La empresa quería seguir creciendo, pero antes tenía que solucionar los problemas para seguir avanzando. De acuerdo al diseño se procedió con la ejecución de un adecuado plan de capacitación, una buena implementación de formularios correctivos, una programación precisa de inducciones en los terminales, un dedicado control de inventario y una oportuna calibración de equipos.

### **3.3.1 Capacitación de inspectores**

Se empezó con los inspectores nuevos y los de muy poca experiencia, ya que eran los que menos trabajos tenían, estaban un poco más libres y sobre todo que eran la mayoría de ellos (55.5% de los inspectores), siempre en coordinación con los despachadores de trabajo. A estos inspectores (grupos de 2 o 3), se les entrenaba una semana (lunes a viernes) en los cinco temas básicos para que tengan un buen conocimiento de los que es la industria petrolera. Se les indicó que previo a cada clase tenían que leer las normas del API que involucraban los temas a tratar (Capítulos 3, 7, 8), y de esa manera poder tener una clase más didáctica y despejar todas las dudas que tengan. Al finalizar cada tema se les tomaba una evaluación, la que tenían que aprobar (80% o más).

Luego de terminada la capacitación con los inspectores nuevos, se prosiguió con los que tenían más experiencia. Con ellos las cosas fueron más fáciles, ya que para ellos era sólo un repaso y reforzamiento en los cinco temas básicos, y se les capacitó en cuatro temas más para que así tengan un amplio conocimiento en los temas de movimientos de productos, algo que ya habían aprendido durante años. Se trató en el caso de ellos que el curso sólo fuera por dos días como máximo y de uno o dos a la vez.

A la par, y eso sí, con todos los inspectores se empezó el reforzamiento por medio del Sistema MSDS online, para que fuera trabajado por ellos desde la casa o en el tiempo que tuvieran libre. Solo se les daba un curso por mes y lo debían completar todos al final del mes. La ventaja de este programa era que no tenían que terminar el curso el mismo día, sino que lo podían hacer en varios días y siempre regresar en donde se habían

quedado. Al fin del curso el sistema les tomaba una evaluación la cual tenían que aprobar (80% o más), de no ser así el sistema les daba la opción de ver todo el curso de nuevo o sólo dar el examen. Todos tenían que aprobar por orden de la gerencia, es por ello que todos se tenían que esforzar y ponerle dedicación al curso. Lo que les ayudó mucho en aumentar sus conocimientos.

El trabajo más tedioso fue ingresar a todos los inspectores al sistema del MSDS online, asignarles el curso del mes, avisarles del curso que tenían que llevar y faltando 5 días para que acabe el mes, darles una llamada y hacerles recordar del curso, que se volvía algo mandatorio por la gerencia desde mayo del 2012. Al mismo tiempo, se hicieron las coordinaciones con los managers de las otras oficinas de la Costa Este, para que enviaran la lista del personal que tenían a su cargo, para poder ingresarlos en el sistema del MSDS online, y que estuvieran al tanto del cumplimiento del curso. Con la colaboración de todos, el programa del MSDS online llegó a buen puerto, ya que con ello se pudo mejorar temas e incluir temas actuales a tratar.

### **3.3.2 Implementación de formularios**

La idea de un formulario completo que pudiera servir para la coordinación conjunta de las actividades de los inspectores comenzó a tener forma. En él se incluyó la inducción (con fecha de expiración) de todos los terminales, los certificados y tarjeta de identificación, así como de los exámenes médicos y respiratorios. Tomó alrededor de una semana juntar documentación en los libros e incluso muchas veces preguntar a los inspectores, ya que ellos solían quedarse con los documentos extraviados. Una vez reunida toda la información, se debía mantener al día, para que así no hubiera problema con los ingresos de los inspectores a los terminales (tal como se muestra en el Anexo 8).

Otro de los formularios que se pusieron en marcha fue el control de actividades que los inspectores pueden desarrollar en los terminales, ya sea con productos claros (ej. Gasolina) o productos negros (ej. crudo). Esto ayudó mucho a conocer que inspector enviar para cada trabajo

en específico, que no sólo se trataba de productos negros o claros, sino saber quien trabajaba como tomador sólo de muestras, de barcaza o barco (tal como se muestra en el Anexo 9).

También, el formulario que fue creado con la intención de hacer más fácil el control de los vehículos que los inspectores conducían, en que estado se encontraban, y si cumplían con llevar siempre con ellos los equipos y la documentación de los mismos, para no tener problema cuando se tuviera una auditoría externa (tal como se muestra en el Anexo 10).

Y no por ello menos importante, se creó los formularios con los que se llevaba un registro de la licencia de conducir de los inspectores, el seguro del auto y la placa del mismo. Lo que ayudó mucho cuando los terminales solicitaban la información de los inspectores para dar permiso de ingreso al terminal o refinería (tal como se muestra en el Anexo 11).

### **3.3.3 Programación de inducciones**

Lo primero que se hizo fue contactar a los encargados de dictar los cursos de inducción de seguridad en los terminales, e informarles de la forma de proceder de cada terminal y que fechas tenían programadas las inducciones cada mes a lo largo del año.

Luego se procedió a recopilar la información de las fechas de vencimiento de la inducción de cada inspector en todos los terminales con los que trabajaba la empresa y así determinar a que inspectores les tocaba ir a inducción cada mes (tal como se puede apreciar al lado derecho del Anexo 8).

Y al final, luego de que acudían al curso de inducción debían acercarse a la oficina y dejar una copia de la tarjeta de inducción actualizada.

### **3.3.4 Control de Inventario de equipos**

El inventario de los equipos fue otro tema, que a pesar de contar con los formularios correctos, no se mantenían actualizados e incluso muchas veces los equipos ya se habían dado de baja y se contaba con otro equipo diferente. Se tubo que revisar todos los gabinetes donde se guardaban los equipos, ver si estaban completos, y si no se reponía la pieza faltante y se guardaban bajo llave con un compromiso de parte de los despachadores de trabajo estar siempre presentes cuando se tomaban los equipos y revisar en que estado regresaban. Fue una labor difícil, pero después de un par de semanas se tuvo en orden (tal como se muestra en el Anexo 12).

### **3.3.5 Calibración de equipos**

El tema de la calibración era algo que no se podía dejar para después, así que se puso en marcha y en coordinación con las empresas calibradoras, se consiguió que todos los equipos estuvieran calibrados en alrededor de tres meses, ya que muchas veces había que enviar los equipos fuera del estado por lo que tomaba tres semanas en retornar el equipo a la oficina.

Una vez que todos los equipos estuvieron calibrados, se procedió a hacer una rutina de calibrar los equipos mensualmente, y cada año enviarlos a la empresa fabricante para su calibración y certificación reglamentaria según la Norma API (tal como se muestra en el Anexo 13).

## **3.4 Seguimiento y control**

Todo el trabajo invertido en el diseño y en la ejecución de la solución, sería en vano, si no se hace un buen seguimiento y control de cada paso de lo ya establecido.

Se continuaron con las capacitaciones hasta que se terminó con todos los inspectores y que por medio de los exámenes se determinó que estaban en un buen nivel, ya que en un 95% de ellos en sus evaluaciones no bajaban del 90%.

Lo positivo del Curso de Capacitación de Normas fue que se consiguió muy buenos resultados al final del año 2012, siendo los porcentajes en los Indicadores de Cobertura (IC) de 98.4% y de Cumplimiento (ICp) de 97.8%, a diferencia con el año 2011, en el que solo se consiguió en el (IC) un 48.8% y en el (ICp) un 47.8%.

En lo que al Programa de Capacitación del MSDS online se refería, se logró al final del año 2012 que los Indicadores de Cobertura (IC) y de Cumplimiento (ICp) estuvieran en un 97.7%, gracias a la colaboración de los inspectores de hidrocarburos, mejorando lo realizado en el año 2011, que fue de solo el 44.4% en ambos indicadores.

Lo significativo de estos resultados, fue que el Índice de Frecuencia (IF), al final del año 2012, se redujera de 37 accidentes cada 200,000 H-H a solo 15 accidentes cada 200,000 H-H.

Otro de los cambios que se consiguieron fue que cada vez que ingresaba un inspector nuevo o con experiencia que antes de empezar a trabajar debía de pasar por los cursos y evaluaciones. También se les explicó cómo usar MSDS online para que no tuvieran problemas.

Y cuando fuera el caso, determinado por la gerencia, inscribir a los inspectores para el examen del IFIA (certificado exigido cada vez más por los terminales, refinerías y los clientes).

Con los formularios se continuó con la actualización constante (cada dos días) para que de ese modo no hubiera problemas cada vez que se tuviera una auditoría sorpresa por algunos de los clientes, y de ese modo también cumplir cada una de las exigencias y estándares establecidos.

Para controlar la evolución de los formularios se estableció el Índice de Aceptación (IA) entre los usuarios (personas del área de capacitación, despachadores de trabajo, jefes de departamento, encargados de cuentas y gerentes). Este (IA) al inicio del proyecto, en enero del año 2012

fue del 30%, el cual después de los cambios y renovaciones subió a un 90% en diciembre del año 2012.

Esto fue de mucha ayuda, no solamente para el área de capacitación, sino también para los despachadores de trabajo que se beneficiaron al tener información precisa y actualizada para poder decidir con más calma y certeza a que inspector elegir para los trabajos y así ir eliminando los problemas del Área de Operaciones.

Los Programas de Inducciones en los terminales o refinerías se siguieron coordinando con sus encargados, para que de ese modo se adelantara o retrasara la inducción de algún inspector y que siempre estuvieran habilitados para ingresar.

Lo satisfactorio del Programa de Inducciones fue que se consiguieron muy buenos resultados al final del año 2012, siendo los porcentajes en los Indicadores de Cobertura (IC) de 97.7% y de Cumplimiento (ICp) de 97.8%, a diferencia con el inicio del año 2012, en el que sólo se consiguió en el (IC) un 46.7% y en el (ICp) un 47.6%.

En el caso que fuera necesaria la inducción y por motivos de fuerza mayor el terminal no realizaba el curso en ese mes, se coordinaba con ellos para que el inspector tuviera permiso hasta el siguiente curso.

Los inventarios se hicieron más exigente y no se permitió que ninguna persona que no estuviera autorizada tuviera acceso a los equipos. Al implementar el Control de Inventarios se pudo mejorar el problema de los Thermoprobe, el cual, al iniciar el proyecto en enero del año 2012, se obtuvo un Indicador de Equipos Dañados y Perdidos (IEDP) del 7.7%, el que cambio notablemente en diciembre del año 2012 obteniendo un valor del 5%.

De esa manera, los inspectores siempre contaban con buenos equipos para realizar su trabajo y que en caso de alguna falla informaran para realizar el cambio respectivo por un equipo en buenas

condiciones. En esos casos, inmediatamente, se actualizaba la lista de los equipos para que así todo estuviera siempre en orden.

Y para finalizar, cuando las calibraciones de los equipos estuvieron actualizadas, se prosiguió con las calibraciones mensuales (para comprobar que los equipos estaban en buen estado), del cual se pudo sacar un Indicador de Equipos Descalibrados (IED) el que en un inicio del proyecto tenía un valor del 5.76%, cosa que al final del proyecto en diciembre del año 2012 cambió a un valor del 3.33%. Asimismo, se programaron las calibraciones anuales (que las realiza el fabricante) que son requeridas por los estándares de las normas del API.

La mayoría de los problemas del Área de Operaciones fueron resueltos con la colaboración de todos, que le “pusieron el hombro” para que este proyecto funcionara. Se volvió una costumbre, lo que ayudó a que en todo momento hubiera una mejora continua en las áreas, en especial al Área de Capacitación.

## **CAPÍTULO IV**

### **REFLEXIÓN CRÍTICA DE LA EXPERIENCIA**

En el área de Capacitación, Seguridad y Control de Equipos la preocupación primordial es que siempre que los inspectores tuvieran los implementos y equipos adecuados para cada trabajo, que entiendan lo importante que es trabajar con seguridad y no poner en riesgo la vida ni la de los demás.

En el momento de que la empresa se empezó a expandir consiguiendo más clientes y por ende más cuentas, hubo la necesidad de contar con los servicios de cada vez más inspectores nuevos y con experiencia. Lo que, sin darse cuenta, salió a la luz problemas en la forma cómo se controlaba las capacitaciones, actualización de formularios correctivos, coordinaciones con los terminales o refinerías para que los inspectores asistan a las inducciones, un mal control de los equipos y la tardía calibración de los mismos.

Es por eso que se puso en marcha el plan de ordenamiento general de todas las actividades, para poder seguir creciendo de forma ordenada y coordinada, manteniendo con ello, las normas de API y así cumplir de buena forma con las auditorías.

Una de las cosas que más ayudó con el cambio, fue la empatía (buena química) que existía con los inspectores, ya que, por mucho tiempo quien escribe trabajó como inspector de hidrocarburos por muchos años y conocía perfectamente la forma de trabajar, el agotamiento (a veces 16 horas

seguidas de trabajo) y las personas con las que se tenía que tratar en los terminales.

El trabajo fue constante y exhaustivo durante unos meses, pero valió la pena. Poco a poco, todos los datos y la información fueron completados, y el manejo de los datos, la información y las coordinaciones se hicieron más rutinarios, casi como una costumbre buena para todos.

El ordenamiento general de todas las actividades comenzó a ser tan eficiente, que la gerencia ordenó que todas las oficinas de la Costa Este del país trabajaran la información y datos como se manejaba en New Jersey.

Una de las primeras oficinas en cambiar la forma de trabajo fue la de Filadelfia, luego siguió la oficina de Virginia. A todos se les tuvo que impartir la forma de ordenar los formularios y las capacitaciones obligatorias de los inspectores. Fue una “experiencia bonita”, ya a pesar de que la gente de otras ciudades era diferente, siempre hubo la buena voluntad de colaborar y ser partícipe del cambio.

En general, esta experiencia profesional permitió ofrecer lo mejor de quien escribe, no solamente como profesional, sino como ser humano y enriquecerse con nuevos conocimientos aprendidos.

## CONCLUSIONES

Las siguientes conclusiones se han obtenido, luego de examinar con mayor detalle toda la solución propuesta a los problemas de la empresa y lo que se obtuvo en resumen como resultado de la implementación de la solución.

1. Se sensibilizó al inspector de hidrocarburos con mucha empatía y sentido del humor en temas actuales de seguridad, logrando que llegara a buen puerto la implementación del programa de capacitación, logrando que en el 95% de ellos en sus evaluaciones no bajaran de 90%.
2. La implementación del Programa de Capacitación ayudó mucho a los inspectores de hidrocarburos a tener mayor conocimiento de las Normas del API, y así tomar mejores decisiones cuando sucedía algún contratiempo, es por eso que los resultados en los Indicadores de Cumplimiento (ICp) de 97.8% y en el de Cobertura (IC) de 98.4% fueron muy favorables al final del año 2012.
3. Los cursos del MSDS online ayudaron a los inspectores a tener una mayor sensibilidad de su seguridad en el campo y de realizar sus labores de una forma más segura, logrando que los Indicadores tanto de Cumplimiento (ICp) como de Cobertura (IC) alcanzaran los valores de 97.7% a finales del año 2012.
4. El Programa de cursos del MSDS online ayudó a muchos inspectores que estaban trabajando fuera de la empresa y que a pesar de no estar de

forma presencial, ellos no paraban con su formación y capacitación en temas de seguridad.

5. Se puede concluir que utilizar herramientas que permitieran llegar a los resultados deseados, como el programa de capacitación, ayudó a que la empresa tuviera mayor confianza en los inspectores para inscribirlos en el examen del IFIA.
6. La implementación de nuevos formularios resultó muy favorable para Amspec, ya que con ellos se obtuvo la información de los inspectores de una forma segura y más actualizada; esto fue gracias a la colaboración de todas las personas del Área de Operaciones que participaron e hicieron que el Índice de Aceptación (IA) llegara a un 90% en diciembre del año 2012.
7. La Programación de Inducciones en los Terminales (en total 6 inducciones) se llevó de una forma más fluida y mejor coordinada con los responsables de los cursos, es por ello que los resultados fueron muy favorables al final del año 2012, con Indicadores de Cobertura (IC) de 97.7% y de Cumplimiento (ICp) de 97.8%, a diferencia con el inicio del año 2012, en el que sólo se consiguió en el (IC) un 46.7% y en el (ICp) un 47.6%.
8. Al aplicar el Control de Inventarios se pudo mejorar el problema de los Thermoprobe, algo muy necesario ya que se debía llevar un buen control de cuántos equipos, quién lo tenía y sí estaban funcionando correctamente; es por ello que, al iniciar el proyecto en enero del año 2012, se obtuvo un Indicador de Equipos Dañados y Perdidos (IEDP) del 7.7%, el que cambio notablemente a finales del año 2012 obteniendo un valor del 5%.
9. La calibración de los equipos fue algo prioritario, ya que una mala medición por culpa de un equipo descalibrado, podía causar muchos

problemas económicos a la empresa; es por eso que se utilizó un Indicador de Equipos Descalibrados (IED) el que a comienzos del año 2012 tenía un valor del 5.76%, cosa que al final del mismo cambió a un valor del 3.33%.

10. Los controles mensuales de los equipos que tenían los inspectores era algo básico que se tenía que hacer para poder detectar a tiempo un mal funcionamiento o un equipo dañado.
11. Las auditorías mensuales internas ayudaron a los inspectores a tener sus vehículos siempre en orden, tanto con los equipos, como con la documentación de ellos a la mano; y de esa manera estar listos para cualquier auditoría externa.
12. Se logró que los inspectores se involucraran no solo en realizar su trabajo, sino cuidar las herramientas y equipos que usaban a diario, considerando que al ser utilizados con frecuencia son como parte de ellos.
13. Gracias al Programa de Capacitación de Normas y al Programa de MSDS online, se obtuvo que los inspectores de hidrocarburos tuvieran más conciencia de su seguridad y que por ende impactara de forma positiva en el Índice de Frecuencia (IF), de manera que al final del año 2012 se redujo notablemente de 37 accidentes cada 200,000 H-H a 15.

## RECOMENDACIONES

1. Continuar con el Programa de Capacitación a los inspectores de hidrocarburos, que tan buenos resultados ha dado y tomar como ejemplo para ser aplicada en otras oficinas de la empresa.
2. Seguir incentivando a los inspectores para que se familiaricen con las Normas API, para que de esa manera no solo puedan aprender y comprender con mayor facilidad las actualizaciones de las mismas, sino que se puedan conservar y mejorar el indicador tanto de Cumplimiento (ICp) como el de Cobertura (IC).
3. Tener en cuenta para el futuro, que el Sistema del MSDS online siga vigente y pueda seguir siendo una herramienta importante para la capacitación de los inspectores de hidrocarburos en temas de seguridad y así mantener siempre altos los indicadores de Cumplimiento (ICp) y de Cobertura (IC).
4. Mantener de forma periódica la innovación de nuevos formularios, y así el Índice de Aceptación (IA) en el Área de Operaciones se pueda mantener y en un futuro mejorarlo.
5. Seguir el camino ya trazado en relación a la Programación de las Inducciones en los Terminales, para que los inspectores no tengan ningún problema al ingresar y puedan cumplir su trabajo asignado, y de esa manera se pueda seguir manteniendo los buenos resultados con los indicadores de control.

6. Mantener activo el plan para el control del inventario de todos los equipos, en especial de los Thermoprobe, para que de esa manera siempre esté actualizado, y el Indicador de Equipos Dañados y Perdidos (IEDP) se pueda mantener bajo.
7. Continuar con las calibraciones periódicas y anuales, para que de esa manera no verse sorprendidos con un mal funcionamiento de los equipos y así mantener bajo el Indicador de Equipos Descalibrados (IED).
8. La gran limitación que se tuvo en este trabajo fue la parte económica, aun cuando el conocer los pasos, procedimientos y alternativas de solución a fin de enfrentar el problema de la empresa, se limitó la labor a la persona designada por la gerencia; se sugiere que, en un futuro, se debe involucrar a todas las partes en el tema económico, a fin de medir el éxito del Programa.

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## ANEXO 1. EXPLICACIÓN DEL PROYECTO DE AMSPEC ONLINE TRAINING

**Joan Carrillo**

---

**From:** Andrew Mortensen [amortensen@amspecllc.com]  
**Sent:** Wednesday, April 25, 2012 9:23 AM  
**To:** Jimmy Cormier; Jorge Pinon; Joan Carrillo; Chris Land; Andres Sosa; Brad Wells; Brendan Corr; Charles Kasecamp; Courtney Vincent; DeonSr Alleyne; ElkinSr Knowles; Frey Thieler; Markus Carneans; Michael Cheney; Mike Mehr; Randal Smith; Ronnie Brecheen; Thomas Francis; Thomas Hobbs; Vincent Micele; Walter Whitfield; Will Brabston  
**Cc:** Matt Corr; Stephen O'Donnell; Malcolm Veila; Jack Smith; Asharaf Tariq; Stan Gondek; Matthew Reilly; Jennifer Nesci; Ina Hermes; Chris Seested  
**Subject:** AmSpec Online Training

We are in the process of renewing our subscription with our online training system administered by MSDSONline. This year our library will comprise of 10 purchased courses. In addition we will be creating and uploading our own training material.

Courses will be generally be assigned one per month, starting in May 2012, although extra ones may be added as necessary to address serious training issues that result from problems experienced in the field or the office.

*To address deficiencies that have been identified by previous customer audits, courses will be assigned not just to field inspectors, but also to all laboratory personnel.*

Assigning of courses, tracking of completion and overall administration will be handled as follows:

**EAST COAST** (Boston, New Haven, New York, Philadelphia, Virginia, Bahamas, Florida, New Orleans, Baton Rouge) –  
**JOAN CARRILLO (Jorge Pinon)**

**GULF/WEST COAST** (Lake Charles, Port Arthur, Houston, Texas City, Corpus Christi, Los Angeles) – **JIMMY CORMIER (Chris Land)**

Monthly compliance reports will be prepared by Joan and Jimmy for review by senior management. Your assistance in ensuring compliance in your area is required. Proof of training for inspectors and laboratory personnel is a guaranteed audit item for both ISO and Customer audits. In this year of ISO re-certification these must be maintained current for your areas.

Joann and Jimmy will begin contacting each of you shortly to ensure all employees are registered in the system and able to log on. To assist in this effort you can also send a list of your current inspectors and lab personnel to your respective Training Administrator.

I am always available to answer any questions regarding this program.

**MAKE SAFETY YOUR #1 FOCUS**

Andrew R Mortensen  
Director, Health, Safety and Training  
Office: (908) 925 7333  
Cell: (856) 693 6308  
[amortensen@amspecllc.com](mailto:amortensen@amspecllc.com)

## ANEXO 2. PERSONAS A CARGO DEL MSDS ONLINE EN LOS ESTADOS DE USA

EZ LCMS
Page 1 of 2

Below is list of groups in this application. To create a new group, click the **Add Group** button. To edit a group, click **Edit** next to the group name. To associate courses with a group, or that all users in the group now and in the future will be assigned to the course, click the **Associations** link next to the group.

Add Group    Search For Group

| Name                | Description                | ID   | # of Users | Limit | Managers                                       | Associated Courses |     |        |              |   |
|---------------------|----------------------------|------|------------|-------|--|--------------------|-----|--------|--------------|---|
| All Ampec Employees |                            | 4794 | 283        | None  | Andy Mortensen<br>Jorge Pineda                 |                    | Edt | Enroll | Associations | X |
| Bahamas             | All Bahamas Personnel      | 4787 | 24         | None  | Elisa Knowles                                  |                    | Edt | Enroll | Associations | X |
| Bahamas             | Inspectors                 | 5613 | 17         | None  | Dorothy Pinder                                 |                    | Edt | Enroll | Associations | X |
| Baton Rouge         |                            | 5298 | 9          | None  | Brad Wells                                     |                    | Edt | Enroll | Associations | X |
| Baton Rouge         | Inspectors                 | 5618 | 8          | None  | Brad Wells                                     |                    | Edt | Enroll | Associations | X |
| Boston              | All Boston Employees       | 4685 | 8          | None  | Mike Mele<br>Courtney Vincent<br>Chuck Kilburn |                    | Edt | Enroll | Associations | X |
| Boston              | Inspectors                 | 5612 | 4          | None  | Mike Mele                                      |                    | Edt | Enroll | Associations | X |
| Corporate           | All Corporate Employees    | 4598 | 23         | None  | Andy Mortensen                                 |                    | Edt | Enroll | Associations | X |
| Corpus Christi      | All Corpus Employees       | 4597 | 5          | None  |  |                    | Edt | Enroll | Associations | X |
| East Coast          | Inspectors                 | 5620 | 98         | None  | Juan Luis Carrillo                             |                    | Edt | Enroll | Associations | X |
| FL                  | All Personnel              | 5184 | 6          | None  | Vincent Micale                                 |                    | Edt | Enroll | Associations | X |
| FL                  | Landerdale Inspectors      | 5618 | 3          | None  | Vincent Micale<br>William Spicer               |                    | Edt | Enroll | Associations | X |
| Houston             | All Houston Employees      | 4688 | 72         | None  | Chris Land                                     |                    | Edt | Enroll | Associations | X |
| HOUSTON             | HOUSTON Inspectors         | 4792 | 32         | None  |  |                    | Edt | Enroll | Associations | X |
| HOUSTON             | LAB Laboratory             | 5468 | 21         | None  | Bratt Downs                                    |                    | Edt | Enroll | Associations | X |
| Lake Charles        | All Lake Charles Employees | 4683 | 3          | None  | Randy Smith                                    |                    | Edt | Enroll | Associations | X |
| Los Angeles         | All California Employees   | 4596 | 4          | None  | Tom Hobbs                                      |                    | Edt | Enroll | Associations | X |
| New Haven           | All New Haven Employees    | 4921 | 6          | None  | Courtney Vincent                               |                    | Edt | Enroll | Associations | X |
| New Haven           | Inspectors                 | 5617 | 3          | None  | Courtney Vincent                               |                    | Edt | Enroll | Associations | X |
| New Orleans         | All New Orleans Employees  | 4601 | 24         | None  | Frey Thielor                                   |                    | Edt | Enroll | Associations | X |
| New Orleans         | Inspectors                 | 5614 | 16         | None  | Frey Thielor<br>Rickie Yount                   |                    | Edt | Enroll | Associations | X |
| New York            | All New York Employees     | 4607 | 83         | None  | Dave Akersyd                                   |                    | Edt | Enroll | Associations | X |
| New York            | Inspectors                 | 5439 | 34         | None  | Juan Luis Carrillo                             |                    | Edt | Enroll | Associations | X |
| New York            | Lab                        | 5609 | 18         | None  |  |                    | Edt | Enroll | Associations | X |
| Philadelphia        | All Philadelphia Employees | 4600 | 22         | None  | Bob Bottanby                                   |                    | Edt | Enroll | Associations | X |
| Philadelphia        | Inspectors                 | 5488 | 9          | None  | Brendan Carr<br>Jude Scramo                    |                    | Edt | Enroll | Associations | X |
| Port Arthur         | All Port Arthur Employees  | 4602 | 9          | None  | Michael Cheney                                 |                    | Edt | Enroll | Associations | X |
| Texas City          | All Texas City Employees   | 4604 | 12         | None  | Ronnie Brecheen                                |                    | Edt | Enroll | Associations | X |
| Virginia            | All Virginia Employees     | 4599 | 5          | None  | Charles Kascocamp                              |                    | Edt | Enroll | Associations | X |
| Virginia            | Inspectors                 | 5616 | 4          | None  | Charles Kascocamp                              |                    | Edt | Enroll | Associations | X |

[http://www.ednovia-learning.com/st\\_groups.asp](http://www.ednovia-learning.com/st_groups.asp)
5/1/2012

Below is list of groups in this registration. To create a new group, click the **Add Group** button. To edit a group, click **Edit** next to the group name. To associate courses with a group, so that all users in the group now and in the future will be assigned to the course, click the **Associate** link next to the group.

[Add Group](#) [Search For Group](#)

| Name                     | Description                | ID   | # of Users | Limit | Managers                                      | Associated Courses |      |        |              |   |
|--------------------------|----------------------------|------|------------|-------|---|--------------------|------|--------|--------------|---|
| All Ampec Employees      |                            | 4784 | 304        | None  | Andy Mortensen<br>Jorge Pina                  |                    | Edit | Enroll | Associations | X |
| Bahamas                  | All Bahamas Personnel      | 4787 | 24         | None  | Elkin Knowles                                 |                    | Edit | Enroll | Associations | X |
| Bahamas Inspectors       |                            | 5513 | 18         | None  | Dorothy Pinder                                |                    | Edit | Enroll | Associations | X |
| Baton Rouge              |                            | 5290 | 9          | None  | Brad Walls                                    |                    | Edit | Enroll | Associations | X |
| Baton Rouge Inspectors   |                            | 5518 | 8          | None  | Brad Walls                                    |                    | Edit | Enroll | Associations | X |
| Boston                   | All Boston Employees       | 4685 | 8          | None  | Mike Melo<br>Courtney Vincent<br>Chuck Kiffen |                    | Edit | Enroll | Associations | X |
| Boston Inspectors        |                            | 5512 | 4          | None  | Mike Melo                                     |                    | Edit | Enroll | Associations | X |
| Corporate                | All Corporate Employees    | 4598 | 23         | None  | Andy Mortensen                                |                    | Edit | Enroll | Associations | X |
| Corpus Christi           | All Corpus Employees       | 4597 | 5          | None  |   |                    | Edit | Enroll | Associations | X |
| East Coast Inspectors    |                            | 5520 | 115        | None  | Juan Luis Carrillo                            |                    | Edit | Enroll | Associations | X |
| FL Lauderdale            | All Personnel              | 5184 | 6          | None  | Vincent Michele                               |                    | Edit | Enroll | Associations | X |
| FL Lauderdale Inspectors |                            | 5510 | 4          | None  | Vincent Michele<br>William Spicer             |                    | Edit | Enroll | Associations | X |
| Houston                  | All Houston Employees      | 4698 | 72         | None  | Chris Land                                    |                    | Edit | Enroll | Associations | X |
| HOUSTON Inspectors       | HOUSTON Inspectors         | 4792 | 32         | None  |   |                    | Edit | Enroll | Associations | X |
| HOUSTON Lab              |                            | 5568 | 21         | None  | Brett Downs                                   |                    | Edit | Enroll | Associations | X |
| Laboratory               |                            | 4785 | 72         | None  |   |                    | Edit | Enroll | Associations | X |
| Lake Charles             | All Lake Charles Employees | 4683 | 3          | None  | Randy Smith                                   |                    | Edit | Enroll | Associations | X |
| Los Angeles              | All California Employees   | 4596 | 4          | None  | Tom Hobbs                                     |                    | Edit | Enroll | Associations | X |
| New Haven                | All New Haven Employees    | 4921 | 6          | None  | Courtney Vincent                              |                    | Edit | Enroll | Associations | X |
| New Haven Inspectors     |                            | 5537 | 4          | None  | Courtney Vincent                              |                    | Edit | Enroll | Associations | X |
| New Orleans              | All New Orleans Employees  | 4681 | 29         | None  | Frey Thieler                                  |                    | Edit | Enroll | Associations | X |
| New Orleans Inspectors   |                            | 5514 | 21         | None  | Frey Thieler<br>Richie Young                  |                    | Edit | Enroll | Associations | X |
| New York                 | All New York Employees     | 4687 | 92         | None  | Dave Akroyd                                   |                    | Edit | Enroll | Associations | X |
| New York Inspectors      |                            | 5419 | 43         | None  | Juan Luis Carrillo                            |                    | Edit | Enroll | Associations | X |
| New York Lab             |                            | 5549 | 18         | None  |   |                    | Edit | Enroll | Associations | X |
| Philadelphia             | All Philadelphia Employees | 4540 | 23         | None  | Bob Bottomly                                  |                    | Edit | Enroll | Associations | X |
| Philadelphia Inspectors  |                            | 5440 | 18         | None  | Brendan Carr<br>Rudy Strano                   |                    | Edit | Enroll | Associations | X |
| Port Arthur              | All Port Arthur Employees  | 4682 | 9          | None  | Michael Cheney                                |                    | Edit | Enroll | Associations | X |
| Texas City               | All Texas City Employees   | 4664 | 12         | None  | Ronnie Brechun                                |                    | Edit | Enroll | Associations | X |
| Virginia                 | All Virginia Employees     | 4599 | 5          | None  | Charles Kaucamp                               |                    | Edit | Enroll | Associations | X |
| Virginia Inspectors      |                            | 5516 | 4          | None  | Charles Kaucamp                               |                    | Edit | Enroll | Associations | X |

## ANEXO 3. VERSIÓN ORIGINAL DEL MSDS ONLINE (FORMULARIO INFORMATIVO)



### Online Training System Operating Instructions

The website for the AmSpec online training system is:

[http://www.ednovia-learning.com/login/364/amspec\\_services.html](http://www.ednovia-learning.com/login/364/amspec_services.html)

The welcome page looks like this:



Your user name is your AmSpec e-mail address:

eg: [amortensen@amspecilc.com](mailto:amortensen@amspecilc.com)

In most cases your AmSpec e-mail address is your first initial and last name @ amspecilc.com. Even if you don't use your AmSpec e-mail address regularly, your user name for signing on is still first initial, last name @ amspecilc.com.

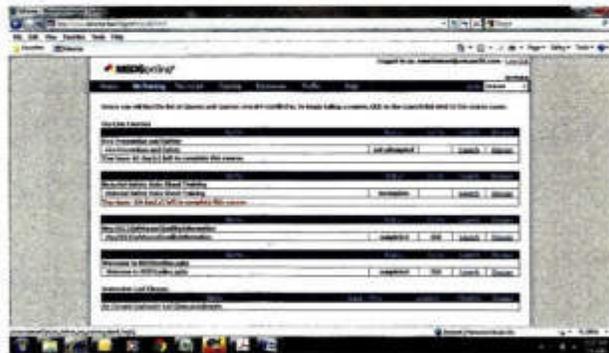
Your initial password is:

**training**

When you sign in you will see the following page:



To view any training classes currently assigned to you, click on the "My Training" button located in the upper left corner, underneath the MSDSonline logo. This will take you to the following page.



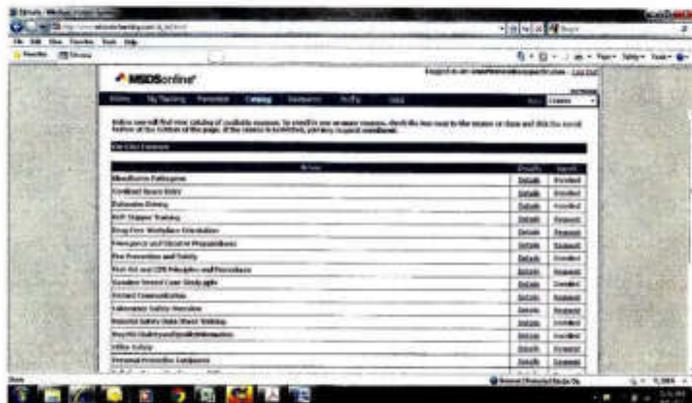
You will now see a list of all courses assigned to you and their current status. If you have already taken and finished the course, it will show "completed".

If you have started it but not finished it, it will show "incomplete". If you have not started the course it will show "not attempted".

To start a course assigned to you, click on the "launch" button on the right of the status.

Note: The first time you try to launch a course, your computer might block the pop ups required. If so, click on the warning sign and then click "Always allow pop ups from this site". You will only have to do this once.

To view the full list of courses available, and to request enrollment in one of the courses, click on the "Catalog" button to the right of "My Training" – this will take you to the following page:



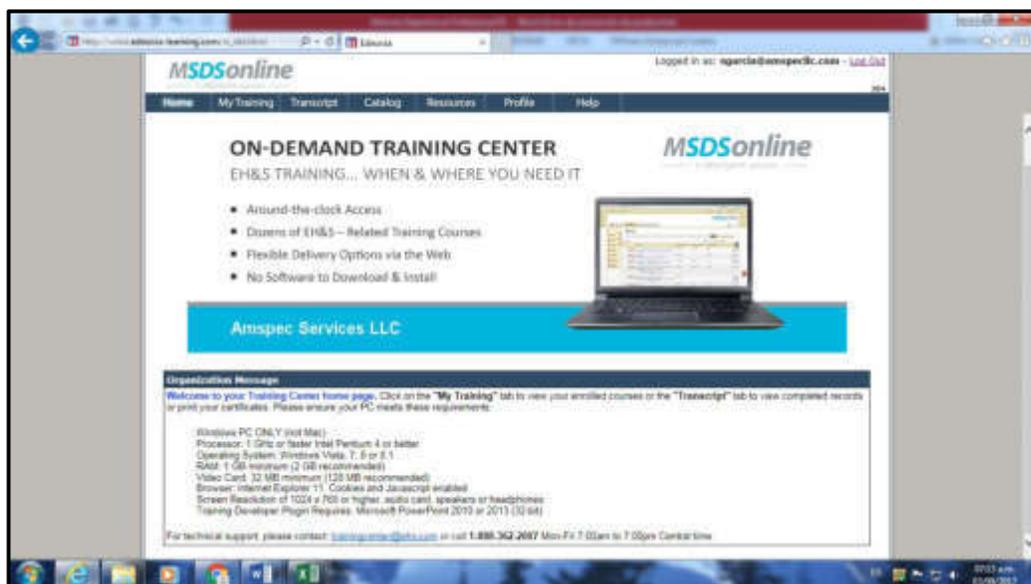
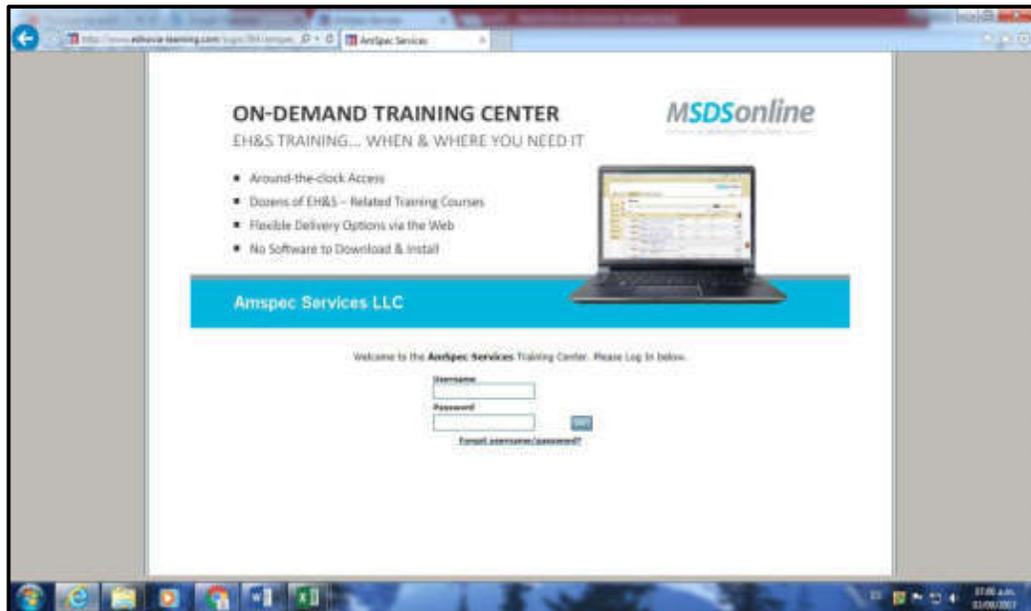
To request one of the courses, click on the "Request" button.

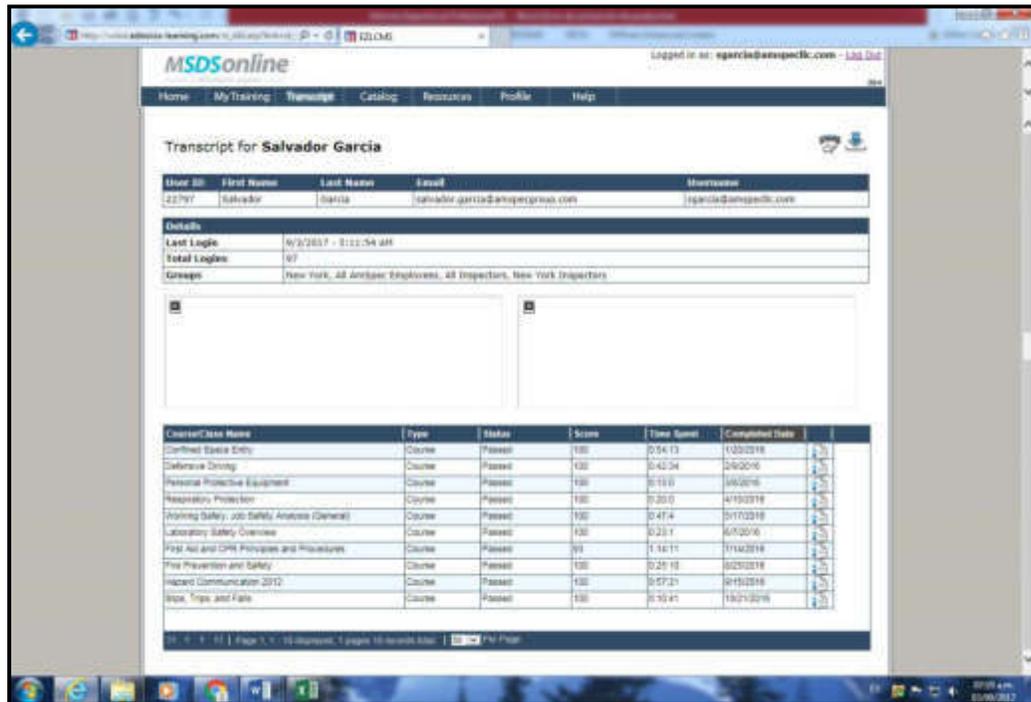
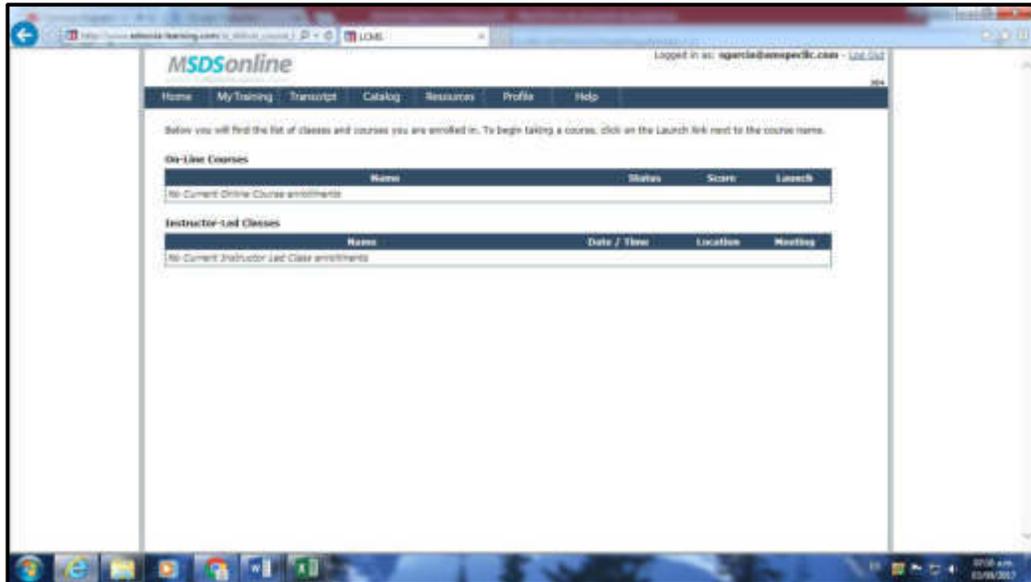
To change your password, click on the "Profile" button. You will then see the following page:

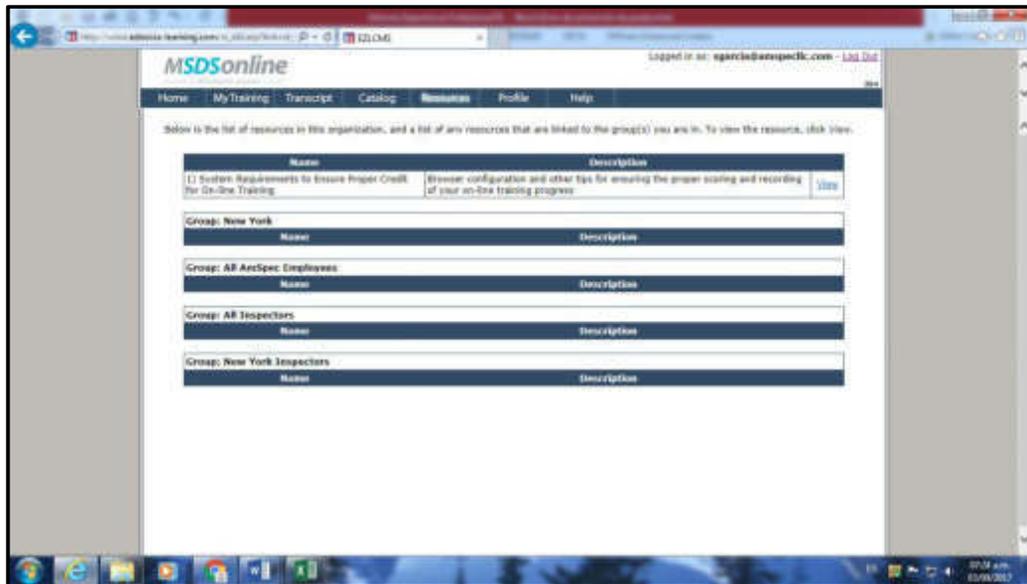
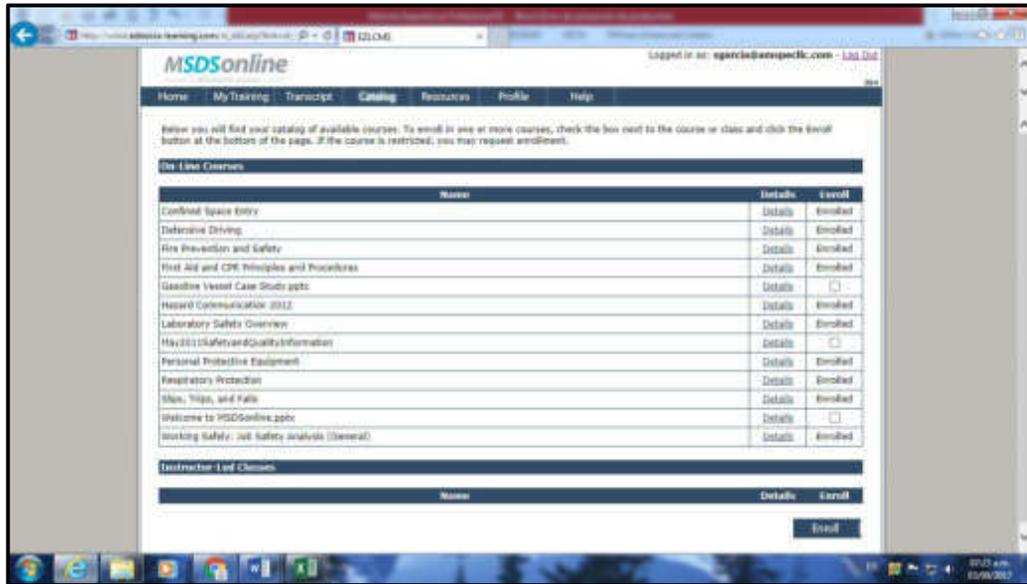


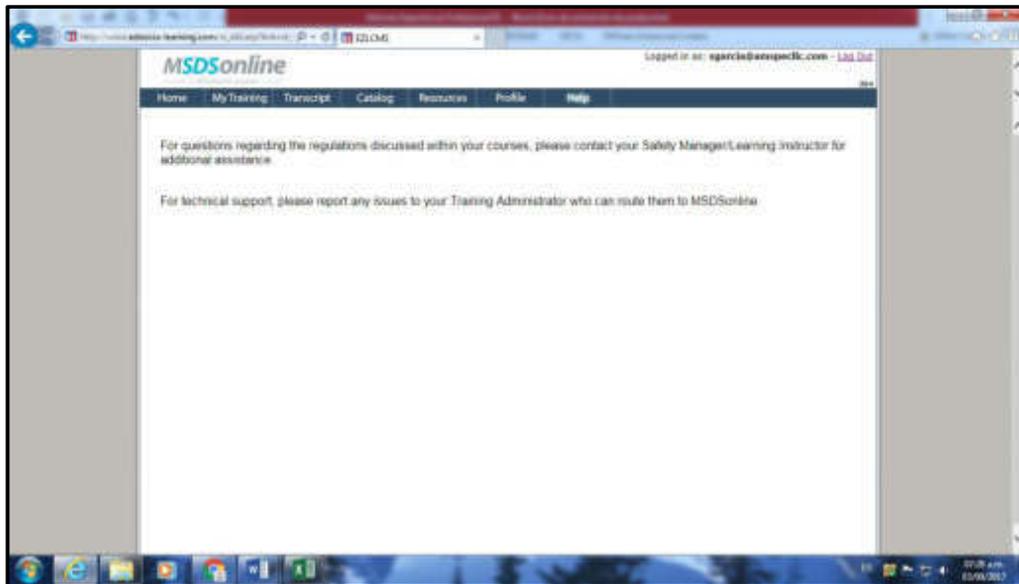
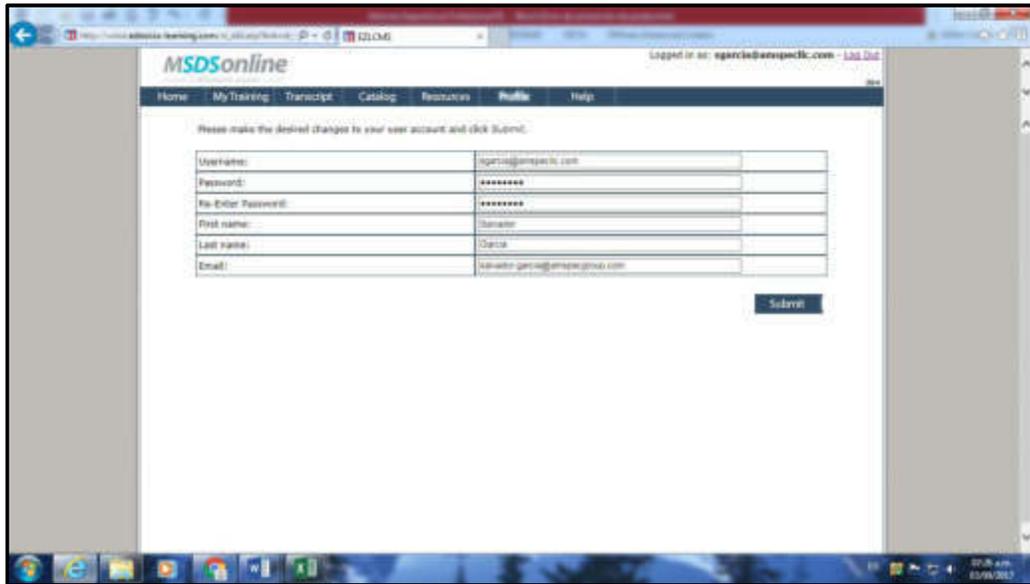
You can change your password in the indicated areas and click on the "submit" button.

## ANEXO 4. EXPLICACIÓN RÁPIDA DE COMO FUNCIONA EL MSDS ONLINE









**ANEXO 5. PERSONAS A CARGO DEL MSDS ONLINE EN LAS OFICINAS  
DE LA COSTA ESTE DEL PAÍS**



**MSDS on line Managers**

| <b><u>Manager</u></b>      | <b><u>First Name</u></b> | <b><u>Last Name</u></b> | <b><u>Email</u></b>                 |
|----------------------------|--------------------------|-------------------------|-------------------------------------|
| <b><i>Bahamas</i></b>      | <i>Dorothy</i>           | <i>Pinder</i>           | <i>dorothy.pinder@amspecllc.com</i> |
| <b><i>Baton Rouge</i></b>  | <i>Brad</i>              | <i>Wells</i>            | <i>bwells@amspecllc.com</i>         |
| <b><i>*Boston*</i></b>     | <i>Mike</i>              | <i>Mehr</i>             | <i>mmehr@amspecllc.com</i>          |
| <b><i>Florida</i></b>      | <i>William</i>           | <i>Spicer</i>           | <i>william.spicer@amspecllc.com</i> |
|                            | <i>Vincent</i>           | <i>Micele</i>           | <i>vmicele@amspecllc.com</i>        |
| <b><i>*New Haven*</i></b>  | <i>Courtney</i>          | <i>Vincent</i>          | <i>cvincent@amspecllc.com</i>       |
| <b><i>New Orleans</i></b>  | <i>Richie</i>            | <i>Young</i>            | <i>ryoung@amspecllc.com</i>         |
|                            | <i>Frey</i>              | <i>Thieler</i>          | <i>fthieler@amspecllc.com</i>       |
| <b><i>*New York*</i></b>   | <i>Joan Luis</i>         | <i>Carrillo</i>         | <i>joan.carrillo@amspecllc.com</i>  |
| <b><i>Philadelphia</i></b> | <i>Rudy</i>              | <i>Serrano</i>          | <i>rudy.serrano@amspecllc.com</i>   |
|                            | <i>Brendan</i>           | <i>Corr</i>             | <i>bcorr@amspecllc.com</i>          |
| <b><i>Virginia</i></b>     | <i>Charles</i>           | <i>Kasecamp</i>         | <i>ckasecamp@amspecllc.com</i>      |

*Report to:*

*Stephen O'Donnell  
(Boston, New Haven and New York)*

*Malcolm Vella  
(Philadelphia, Virginia, Florida, New Orleans, Baton Rouge and Bahamas)*

*Report Also to:*

*Andy Mortensen  
Jorge Piñon*

## ANEXO 6. CURSOS HABILITADOS DEL MSDS ONLINE



*MSDS online*

| <i>No.</i> | <i>Courses</i>  | <i>Numbers of Module</i> | <i>Number of Pages</i> | <i>Number of Questions</i> |
|------------|---|--------------------------|------------------------|----------------------------|
| 1          | <i>Slips, Trips and Fall</i>                          | 3                        | <i>(1 - 35)</i>        | 7                          |
| 2          | <i>Personal Protective Equipment</i>                  | 4                        | <i>(1 - 103)</i>       | 16                         |
| 3          | <i>Hazard Communication</i>                           | 3                        | <i>(1 - 90)</i>        | 12                         |
| 4          | <i>Working Safely: Job Safety Analysis</i>            | 4                        | <i>(1 - 97)</i>        | 15                         |
| 5          | <i>Defensive Driving</i>                              | 3                        | <i>(1 - 61)</i>        | 11                         |
| 6          | <i>First Aid and CPR Principles and Procedures</i>    | 7                        | <i>(1 - 135)</i>       | 30                         |
| 7          | <i>Respiratory Protection</i>                         | 3                        | <i>(1 - 81)</i>        | 13                         |
| 8          | <i>Fire Prevention and Safety</i>                     | 4                        | <i>(1 - 47)</i>        | 10                         |
| 9          | <i>Confined Space Entry</i>                           | 4                        | <i>(1 - 92)</i>        | 15                         |
| 10         | <i>Laboratory Safety Overview</i>                     | 2                        | <i>(1 - 38)</i>        | 5                          |
| 11         | <i>Working in Extreme Temperatures</i>                | 4                        | <i>(1 - 64)</i>        | 12                         |
| 12         | <i>Workplace Violence</i>                             | 4                        | <i>(1 - 72)</i>        | 14                         |
| 13         | <i>Drug-Free Workplace Orientation</i>                | 2                        | <i>(1 - 49)</i>        | 9                          |
| 14         | <i>Behavior-based Safety Training for Supervisors</i> | 4                        | <i>(1 - 69)</i>        | 13                         |
| 15         | <i>Bloodborne Pathogens</i>                           | 5                        | <i>(1 - 94)</i>        | 16                         |
| 16         | <i>Sexual Harassment Prevention</i>                   | 3                        | <i>(1 - 49)</i>        | 10                         |
| 17         | <i>Material Safety Data Sheet Training</i>            | 3                        | <i>(1 - 50)</i>        | 8                          |
| 18         | <i>Emergency and Disaster Preparedness</i>            | 4                        | <i>(1 - 68)</i>        | 12                         |

**ANEXO 7. INSPECTORES INSCRITOS EN EL MSDS ONLINE EN LAS  
OFICINAS DE LA COSTA ESTE DEL PAÍS**



*New York Inspectors*

| <i>No.</i> | <i>Last Name</i> | <i>First Name</i> | <i>Cell Phone</i> | <i>Email</i>                     |
|------------|------------------|-------------------|-------------------|----------------------------------|
| 1          | Acosta           | Lemyn             | (732) 309-1623    | lemyn.acosta@amspecllc.com       |
| 2          | Atanassov        | Jivko             | (908) 347-9095    | jivko.atanassov@amspecllc.com    |
| 3          | Bafico           | Javier            | (908) 290-7552    | javier.bafico@amspecllc.com      |
| 4          | Bhat             | Ramchandra        | (908) 413-2638    | ramchandra.bhat@amspecllc.com    |
| 5          | Borgono          | Edgar             | (908) 413-0427    | edgar.borgono@amspecllc.com      |
| 6          | Bueno            | Wilson            | (908) 414-0103    | wbueno@amspecllc.com             |
| 7          | Campbell         | David             | (908) 380-9906    | david.campbell@amspecllc.com     |
| 8          | Cantelmi         | John              | (908) 370-9716    | john.cantelmi@amspecllc.com      |
| 9          | Cedro            | Ernesto           | (973) 747-4845    | ecedro1948@yahoo.com             |
| 10         | Cheatham         | Kenneth           | (908) 249-3733    | kenneth.cheatham@amspecllc.com   |
| 11         | Cipriano         | Frank             | (908) 487-4928    | frank.cipriano@amspecllc.com     |
| 12         | Cole             | Ian               | (518) 779-5856    | ian.cole@amspecllc.com           |
| 13         | De Luna          | Carlos            | (908) 413-0385    | cdeluna@amspecllc.com            |
| 14         | Elmasry          | Mohamed           | (908) 414-0505    | mohamed.elmasry@amspecllc.com    |
| 15         | Estrada          | Nelson            | (908) 414-0792    | nelson.estrada@amspecllc.com     |
| 16         | Fabricatore      | James             | (908) 410-7504    | jfabricatore@amspecllc.com       |
| 17         | Ferreira         | Jose              | (908) 419-9475    | jose.ferreira@amspecllc.com      |
| 18         | Garcia           | Hector            | (908) 487-1379    | hector.garcia@amspecllc.com      |
| 19         | Garcia           | Salvador          | (732) 309-1628    | salvador.garcia@amspecllc.com    |
| 20         | Gonzalez         | Pablo             | (908) 472-4816    | pablo.gonzalez@amspecllc.com     |
| 21         | Ira              | Constancio        | (908) 587-6391    | constancio.ira@amspecllc.com     |
| 22         | Koncen           | Andrew            | (908) 313-3010    | andrew.koncen@amspecllc.com      |
| 23         | Kraemer          | John              | (908) 380-9658    | jkraemer@amspecllc.com           |
| 24         | Lane             | Joshua            | (518) 935-8417    | joshua.lane@amspecllc.com        |
| 25         | Lewis            | Alvin             | (908) 425-0196    | alvin.lewis@amspecllc.com        |
| 26         | Liabach          | Edward            | (908) 413-0425    | edward.liabach@amspecllc.com     |
| 27         | McDougall        | Robert            | (908) 603-9009    | robert.mcdougall@amspecllc.com   |
| 28         | Medvedev         | Mikhail           | (908) 487-4627    | mikhail.medvedev@amspecllc.com   |
| 29         | Mellijor         | Philip            | (908) 456-1551    | philip.mellijor@amspecllc.com    |
| 30         | Mendoza          | David             | (908) 400-5267    | david.mendoza@amspecllc.com      |
| 31         | Onellette        | Peter             | (908) 307-7862    | ponellette@amspecllc.com         |
| 32         | Papa             | Paul              | (908) 220-5210    | paul.papa@amspecllc.com          |
| 33         | Pellegrini       | Rich              | (201) 344-4450    | richard.pellegrini@amspecllc.com |
| 34         | Petrone          | Louis             | (908) 220-9779    | louis.petrone@amspecllc.com      |
| 35         | Reis             | Danny             | (908) 487-1240    | danny.reis@amspecllc.com         |
| 36         | Rubenstein       | Joe               | (908) 230-1188    | joseph.rubenstein@amspecllc.com  |
| 37         | Sanchez          | John              | (518) 225-5625    | john.sanchez@amspecllc.com       |
| 38         | Soares           | Roger             | (908) 368-3012    | roger.soares@amspecllc.com       |
| 39         | Sosa             | Marcelo           | (908) 400-2547    | marcelo.sosa@amspecllc.com       |
| 40         | Sosa             | Sergio            | (908) 759-8869    | sergio.sosa@amspecllc.com        |
| 41         | Temple           | Glenn             | (908) 247-6344    | glenn.temple@amspecllc.com       |
| 42         | Uribe            | Luis              | (908) 414-0773    | luis.uribe@amspecllc.com         |
| 43         | Uygun            | Mehmet            | (908) 400-2546    | mehmet.uygun@amspecllc.com       |

*Manager: Joan Luis Carrillo*



## *Bahamas Inspectors*

| <b>No.</b> | <b>Last Name</b> | <b>First Name</b> | <b>Email</b>                |
|------------|------------------|-------------------|-----------------------------|
| 1          | Adderley         | Edward            | eadderley@amspecllc.com     |
| 2          | Alleyne Jr.      | Deon              | dalleyne@amspecllc.com      |
| 3          | Blatch           | Kalvin            | kblatch@amspecllc.com       |
| 4          | Cartwright       | Donovan           | dcartwright@amspecllc.com   |
| 5          | Clarke           | Kenron            | kclarke@amspecllc.com       |
| 6          | Colebrooke       | Genardo           | gcolebrooke@amspecllc.com   |
| 7          | Cooper           | Melvin            | melvin.cooper@amspecllc.com |
| 8          | Grant            | Quillon           | qgrant@amspecllc.com        |
| 9          | Hall             | Godfrey           | ghall@amspecllc.com         |
| 10         | Johnson          | Timayne           | tjohnson@amspecllc.com      |
| 11         | Kemp             | Roger             | rkemp@amspecllc.com         |
| 12         | Knowles          | Craig             | cknowles@amspecllc.com      |
| 13         | McPhee           | Theo              | tmcphee@amspecllc.com       |
| 14         | Moss             | Charles           | cmoss@amspecllc.com         |
| 15         | Roberts          | Ronald            | rroberts@amspecllc.com      |
| 16         | Rolle            | Anthony           | arolle@amspecllc.com        |
| 17         | Russell          | Romal             | rrussell@amspecllc.com      |
| 18         | Tate             | Kevin             | ktate@amspecllc.com         |

Manager: Dorothy Pinder



## *New Haven Inspectors*

| <b>No.</b> | <b>Last Name</b> | <b>First Name</b> | <b>Email</b>               |
|------------|------------------|-------------------|----------------------------|
| 1          | Bacon            | Ken               | kbacon@amspecllc.com       |
| 2          | Nelson           | William           | bill.nelson@amspecllc.com  |
| 3          | Rodriguez        | Juan              | jrodriguez@amspecllc.com   |
| 4          | Yeager           | Danny             | danny.yeager@amspecllc.com |

Manager: Courtney Vincent



## **Philadelphia Inspectors**

| <b>No.</b> | <b>Last Name</b> | <b>First Name</b> | <b>Email</b>                    |
|------------|------------------|-------------------|---------------------------------|
| 1          | Bates            | John              | john.bates@amspecllc.com        |
| 2          | Floyd            | Anthony           | Anthony.Floyd@amspecllc.com     |
| 3          | Freitas          | Thomas            | Tom.Freitas@amspecllc.com       |
| 4          | Gillman          | Rob               | Rob.Gillman@amspecllc.com       |
| 5          | Grant            | Jeff              | Jeff.Grant@amspecllc.com        |
| 6          | Mikolajczak      | Brian             | Brian.Mikolajczak@amspecllc.com |
| 7          | Panov            | Maksim            | maksim.panov@amspecllc.com      |
| 8          | Pearson          | Randy             | Randy.Pearson@amspecllc.com     |
| 9          | Sammons          | James             | James.Sammons@amspecllc.com     |
| 10         | Whitelaw         | Jason             | Jason.Whitelaw@amspecllc.com    |

*Manager: Rudy Serrano & Brendan Corr*



## **Boston Inspectors**

| <b>No.</b> | <b>Last Name</b> | <b>First Name</b> | <b>Email</b>           |
|------------|------------------|-------------------|------------------------|
| 1          | Dias             | Mark              | mdias@amspecllc.com    |
| 2          | Rivera           | Miguel            | mrivera@amspecllc.com  |
| 3          | Skander          | Souhil            | sskander@amspecllc.com |
| 4          | Uribe            | Michael           | muribe@amspecllc.com   |

*Manager: Mike Mehr*



## *New Orleans Inspectors*

| <b>No.</b> | <b>Last Name</b>   | <b>First Name</b> | <b>Email</b>                        |
|------------|--------------------|-------------------|-------------------------------------|
| 1          | <i>Araga</i>       | <i>Rommel</i>     | <i>raraga@amspecllc.com</i>         |
| 2          | <i>Bachar</i>      | <i>Chris</i>      | <i>cbachar@amspecllc.com</i>        |
| 3          | <i>Becnel</i>      | <i>Victor</i>     | <i>vbecnel@amspecllc.com</i>        |
| 4          | <i>Bourg</i>       | <i>Toni</i>       | <i>tbourg@amspecllc.com</i>         |
| 5          | <i>Chuahong</i>    | <i>Glenn</i>      | <i>gchuahong@amspecllc.com</i>      |
| 6          | <i>Flores</i>      | <i>Greg</i>       | <i>gflores@amspecllc.com</i>        |
| 7          | <i>Flores</i>      | <i>Wilcis</i>     | <i>wilcis.flores@amspecllc.com</i>  |
| 8          | <i>Hunger</i>      | <i>Dave</i>       | <i>dhunger@amspecllc.com</i>        |
| 9          | <i>Johnson</i>     | <i>Matthew</i>    | <i>mjohnson@amspecllc.com</i>       |
| 10         | <i>Lopez</i>       | <i>Rene</i>       | <i>rene.lopez@amspecllc.com</i>     |
| 11         | <i>McKinney</i>    | <i>Ben</i>        | <i>bmckinney@amspecllc.com</i>      |
| 12         | <i>Miguel</i>      | <i>Jude</i>       | <i>jmiguel@amspecllc.com</i>        |
| 13         | <i>Navarre</i>     | <i>Aaron</i>      | <i>anavarre@amspecllc.com</i>       |
| 14         | <i>Nelson</i>      | <i>Ryan</i>       | <i>rnelson@amspecllc.com</i>        |
| 15         | <i>Norman</i>      | <i>Troy-Don</i>   | <i>tnorman@amspecllc.com</i>        |
| 16         | <i>Parasuraman</i> | <i>Elangovan</i>  | <i>eparasuraman@amspecllc.com</i>   |
| 17         | <i>Rabalais</i>    | <i>Steve</i>      | <i>steve.rabalais@amspecllc.com</i> |
| 18         | <i>Richards</i>    | <i>Bradley</i>    | <i>brichards@amspecllc.com</i>      |
| 19         | <i>Roy</i>         | <i>Trishton</i>   | <i>troy@amspecllc.com</i>           |
| 20         | <i>Smedley</i>     | <i>Sam</i>        | <i>ssmedley@amspecllc.com</i>       |
| 21         | <i>Smira</i>       | <i>Gabriel</i>    | <i>gsmira@amspecllc.com</i>         |

*Manager: Richie Young & Frey Thieler*



## *Florida Inspectors*

| <b>No.</b> | <b>Last Name</b> | <b>First Name</b>  | <b>Email</b>                    |
|------------|------------------|--------------------|---------------------------------|
| 1          | <i>Korolkov</i>  | <i>Eugene</i>      | <i>ekorolkov@amspecllc.com</i>  |
| 2          | <i>Nistorica</i> | <i>Alexandru</i>   | <i>anistorica@amspecllc.com</i> |
| 3          | <i>Shumeev</i>   | <i>Valadimir</i>   | <i>vshumeev@amspecllc.com</i>   |
| 4          | <i>Zialionka</i> | <i>Aliakasandr</i> | <i>azialionka@amspecllc.com</i> |

*Manager: William Spicer & Vincent Micele*



## *Baton Rouge Inspectors*

| <b>No.</b> | <b>Last Name</b> | <b>First Name</b> | <b>Email</b>                 |
|------------|------------------|-------------------|------------------------------|
| 1          | Frame            | Casey             | casey.frame@amspecllc.com    |
| 2          | Fritchie         | Luke              | luke.fritchie@amspecllc.com  |
| 3          | Fruge            | Matt              | matt.fruge@amspecllc.com     |
| 4          | Gould            | Robbie            | robbie.gould@amspecllc.com   |
| 5          | Hughes           | Jack              | jack.hughes@amspecllc.com    |
| 6          | Meadows          | Josh              | josh.meadows@amspecllc.com   |
| 7          | Motichek         | Kerry             | kmotichek@amspecllc.com      |
| 8          | Wells            | Michelle          | michelle.wells@amspecllc.com |

*Manager: Brad Wells*



## *Virginia Inspectors*

| <b>No.</b> | <b>Last Name</b> | <b>First Name</b> | <b>Email</b>                     |
|------------|------------------|-------------------|----------------------------------|
| 1          | Ehlers           | Rick              | rehlers@amspecllc.com            |
| 2          | Jakubowski       | Charles           | charles.jakubowski@amspecllc.com |
| 3          | Katz             | Keith             | kkatz@amspecllc.com              |
| 4          | Ragans           | Valerie           | valerie.ragans@amspecllc.com     |

*Manager: Charles Kasecamp*

## ANEXO 8. FORMATO DE INDUCCIONES EN LOS TERMINALES, CERTIFICADOS Y EXÁMENES CON FECHA DE EXPIRACIÓN

→ ACTIVE
→ EXPIRED

| INSPECTORS         | Benzene Test Exp. Date | Drug & Alcohol Test Exp. Date | Respirator Fit Test Exp. Date | IFIA Cert. Exp. Date | Twic Card Exp. Date | SCBA Training Exp. Date | B.A.S.E. Rayway Exp. Date | Hess Bayonne Training Exp. Date | Hess Pt. Reading Training Exp. Date | IMTT Training Exp. Date | KMI Training Exp. Date | Motiva Training Exp. Date |
|--------------------|------------------------|-------------------------------|-------------------------------|----------------------|---------------------|-------------------------|---------------------------|---------------------------------|-------------------------------------|-------------------------|------------------------|---------------------------|
| Acosta, Lenny      | 08/05/2013             | 08/05/2013                    | 22/05/2013                    | 15/11/2012           | 22/02/2013          | N/A                     | 30/03/2013                | N/A                             | 21/06/2013                          | 08/02/2013              | 31/01/2013             | CERTIFIED                 |
| Atanassov, Jivko   | 04/10/2013             | 04/10/2013                    | 15/10/2013                    | N/A                  | 25/10/2012          | N/A                     | N/A                       | N/A                             | N/A                                 | 17/10/2013              | 16/10/2013             | CERTIFIED                 |
| Baffico, Javier    | 23/08/2013             | 23/08/2013                    | 23/08/2013                    | 02/11/2012           | 27/04/2016          | N/A                     | N/A                       | 11/04/2013                      | N/A                                 | 05/09/2013              | 02/10/2013             | CERTIFIED                 |
| Bhat, Ramchandra   | 12/03/2013             | 12/03/2013                    | 12/03/2013                    | 14/08/2012           | 15/09/2013          | N/A                     | N/A                       | 02/04/2013                      | N/A                                 | N/A                     | 11/09/2013             | CERTIFIED                 |
| Borgono, Edgar     | 05/11/2013             | 05/11/2013                    | 06/12/2012                    | 20/03/2013           | 13/02/2013          | N/A                     | N/A                       | N/A                             | 21/06/2013                          | N/A                     | 02/08/2013             | CERTIFIED                 |
| Buono, Wilson      | 26/03/2013             | 26/03/2013                    | 25/01/2013                    | 03/08/2012           | 03/03/2016          | N/A                     | N/A                       | 28/03/2013                      | 21/06/2013                          | 08/02/2013              | 20/03/2013             | N/A                       |
| Campbell, David    | 16/03/2013             | 16/03/2013                    | 09/01/2013                    | 12/07/2013           | 13/04/2013          | N/A                     | N/A                       | 04/04/2013                      | N/A                                 | N/A                     | 16/10/2013             | N/A                       |
| Cantelmi, John     | 31/10/2013             | 31/10/2013                    | 16/08/2013                    | 04/04/2016           | 17/04/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | 18/10/2012             | N/A                       |
| Cedro, Ernesto     | 12/03/2013             | 12/03/2013                    | 12/03/2013                    | N/A                  | 29/03/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | 06/06/2013              | 07/10/2013             | N/A                       |
| Cheatham, Kenneth  | 28/09/2013             | 28/09/2013                    | 08/10/2013                    | 20/03/2013           | 10/02/2013          | N/A                     | N/A                       | 17/10/2013                      | N/A                                 | 02/12/2012              | 16/10/2013             | CERTIFIED                 |
| Cipriano, Frank    | 15/09/2013             | 15/09/2013                    | 01/10/2013                    | N/A                  | 06/09/2012          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | 02/10/2013             | N/A                       |
| Cole, Ian          | 22/03/2013             | 22/03/2013                    | 21/02/2013                    | N/A                  | 15/09/2016          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | N/A                    | N/A                       |
| DeLuna, Carlos     | 12/03/2013             | 12/03/2013                    | 01/12/2012                    | 31/01/2013           | 22/03/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | 02/10/2013             | N/A                       |
| Elmasry, Mohammed  | 09/05/2013             | 09/05/2013                    | 09/05/2013                    | 02/06/2016           | 10/04/2015          | N/A                     | N/A                       | N/A                             | 07/11/2012                          | 08/08/2013              | 07/08/2013             | N/A                       |
| Estrada, Nelson    | 04/05/2013             | 04/05/2013                    | 02/05/2013                    | N/A                  | 27/11/2016          | N/A                     | N/A                       | 22/06/2013                      | N/A                                 | 09/05/2013              | 15/05/2013             | N/A                       |
| Fabricatore, James | 06/06/2013             | 06/06/2013                    | 05/06/2013                    | 02/04/2016           | 25/07/2016          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | 11/09/2013             | N/A                       |
| Ferreira, Jose     | 01/06/2013             | 01/06/2013                    | 22/06/2013                    | N/A                  | 25/05/2017          | N/A                     | N/A                       | 02/07/2013                      | 28/06/2013                          | 27/06/2013              | 01/02/2013             | CERTIFIED                 |
| Garcia, Hector     | 17/02/2013             | 17/02/2013                    | 17/01/2013                    | 21/01/2016           | 11/08/2015          | 12/10/2012              | 30/03/2013                | N/A                             | 19/01/2013                          | 10/10/2013              | 20/03/2013             | N/A                       |
| Garcia, Salvador   | 03/03/2013             | 03/03/2013                    | 12/09/2013                    | 10/06/2016           | 14/01/2013          | N/A                     | 04/04/2013                | 28/03/2013                      | 25/03/2013                          | 30/11/2012              | 02/10/2013             | CERTIFIED                 |
| Gonzalez, Pablo    | 31/05/2013             | 31/05/2013                    | 18/06/2013                    | 15/11/2012           | 27/04/2013          | N/A                     | N/A                       | 02/07/2013                      | N/A                                 | 27/06/2013              | 21/08/2013             | N/A                       |
| Ira, Constancio    | 20/04/2013             | 20/04/2013                    | 14/05/2013                    | 11/05/2016           | 05/12/2013          | N/A                     | 21/05/2013                | N/A                             | N/A                                 | 23/05/2013              | 01/04/2013             | N/A                       |
| Koncen, Andrew     | 30/01/2013             | 30/01/2013                    | 30/01/2013                    | 01/03/2017           | 14/03/2016          | N/A                     | N/A                       | N/A                             | N/A                                 | 21/03/2013              | 07/08/2013             | CERTIFIED                 |
| Kraemer, John      | 17/10/2013             | 17/10/2013                    | 28/09/2013                    | 12/11/2014           | 30/09/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | 02/10/2013             | N/A                       |
| Lane, Joshua       | 09/12/2012             | 09/12/2012                    | 08/12/2012                    | N/A                  | 30/04/2015          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | N/A                    | N/A                       |
| Lewis, Alvin       | 04/04/2013             | 04/04/2013                    | 05/10/2013                    | 20/03/2013           | 23/08/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | 18/01/2013              | 31/01/2013             | CERTIFIED                 |
| Liabach, Edward    | 19/10/2013             | 19/10/2013                    | 19/10/2013                    | 15/11/2012           | 06/04/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | N/A                    | N/A                       |
| McDougall, Robert  | 25/11/2012             | 25/11/2012                    | 06/12/2012                    | 21/03/2016           | 26/10/2014          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | 02/10/2013             | N/A                       |
| Medvedev, Mikhail  | 21/05/2013             | 21/05/2013                    | 21/05/2013                    | 28/02/2017           | 12/12/2014          | N/A                     | N/A                       | 11/07/2013                      | 16/07/2013                          | 23/05/2013              | 05/06/2013             | CERTIFIED                 |
| Mellijor, Philip   | 04/05/2013             | 04/05/2013                    | 29/05/2013                    | 11/07/2016           | 14/09/2014          | N/A                     | N/A                       | 11/07/2013                      | 28/06/2013                          | 30/05/2013              | 01/07/2013             | N/A                       |
| Mendoza, David     | 07/06/2013             | 07/06/2013                    | 08/06/2013                    | 21/01/2016           | 24/05/2013          | N/A                     | N/A                       | 28/03/2013                      | N/A                                 | 15/02/2013              | 04/04/2013             | N/A                       |
| Ouellete, Peter    | 16/10/2013             | 16/10/2013                    | 18/11/2012                    | N/A                  | 21/11/2013          | 12/10/2012              | 30/03/2013                | 21/03/2013                      | CERTIFIED                           | 14/12/2012              | 17/04/2013             | CERTIFIED                 |
| Papa, Paul         | 02/03/2013             | 02/03/2013                    | 05/03/2013                    | 03/08/2016           | 21/11/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | 13/03/2014             | N/A                       |
| Pellegrini, Rich   | 29/06/2013             | 29/06/2013                    | 06/06/2013                    | N/A                  | 20/12/2014          | 12/10/2012              | N/A                       | N/A                             | N/A                                 | 22/02/2013              | N/A                    | N/A                       |
| Petronis, Lou      | 01/12/2012             | 01/12/2012                    | 01/12/2012                    | N/A                  | 24/09/2014          | 26/10/2012              | N/A                       | 21/03/2013                      | 25/01/2013                          | 18/01/2013              | 05/06/2013             | CERTIFIED                 |
| Reis, Danny        | 15/04/2013             | 15/04/2013                    | 21/05/2013                    | N/A                  | 29/03/2012          | N/A                     | N/A                       | 17/10/2013                      | N/A                                 | 23/05/2013              | 05/06/2013             | N/A                       |
| Rubenstein, Joe    | 07/12/2012             | 07/12/2012                    | 14/12/2012                    | 19/11/2014           | 10/02/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | 22/02/2013              | 03/04/2013             | N/A                       |
| Sanchez, John      | 02/10/2013             | 02/10/2013                    | 09/07/2013                    | 20/03/2013           | 12/04/2013          | N/A                     | N/A                       | N/A                             | N/A                                 | N/A                     | N/A                    | N/A                       |
| Soares, Roger      | 10/10/2013             | 10/10/2013                    | 19/09/2013                    | 17/07/2013           | 02/07/2013          | 12/10/2012              | N/A                       | 21/03/2013                      | 16/02/2013                          | 28/03/2013              | 31/01/2013             | N/A                       |
| Sosa, Marcelo      | 06/12/2012             | 06/12/2012                    | 16/03/2013                    | 12/11/2014           | 15/09/2013          | N/A                     | N/A                       | N/A                             | 07/06/2013                          | 01/08/2013              | 16/10/2013             | CERTIFIED                 |
| Sosa, Sergio       | 26/03/2013             | 26/03/2013                    | 26/03/2013                    | 14/09/2017           | 26/04/2016          | N/A                     | N/A                       | 04/04/2013                      | 21/06/2013                          | 30/05/2013              | 11/09/2013             | CERTIFIED                 |
| Temple, Glenn      | 04/09/2013             | 04/09/2013                    | 01/11/2013                    | N/A                  | 14/04/2017          | N/A                     | N/A                       | 27/09/2013                      | N/A                                 | 19/09/2013              | 15/05/2013             | N/A                       |
| Uribe, Luis        | 20/09/2013             | 20/09/2013                    | 25/09/2013                    | N/A                  | 27/02/2013          | N/A                     | N/A                       | 17/10/2013                      | N/A                                 | 26/09/2013              | 02/10/2013             | N/A                       |
| Uygun, Mehmet      | 02/10/2013             | 02/10/2013                    | 12/11/2012                    | 10/06/2016           | 12/11/2013          | 26/10/2012              | N/A                       | N/A                             | N/A                                 | N/A                     | 20/03/2013             | N/A                       |

**ANEXO 9. LISTA DE ACTIVIDADES APROBADAS QUE LOS INSPECTORES PUEDEN REALIZAR EN CADA TERMINAL**



**BP INSPECTORS APPROVED LIST**

| No. | INSPECTOR          | = INSPECTORS APPROVED |                 |                 |               |                |              |
|-----|--------------------|-----------------------|-----------------|-----------------|---------------|----------------|--------------|
|     |                    | SAMPLER CLEAN OIL     | SAMPLER RESIDUE | BARGE CLEAN OIL | BARGE RESIDUE | SHIP CLEAN OIL | SHIP RESIDUE |
| 1   | Acosta, Lenny      | ✓                     | ✓               | ✓               | ✓             | ✓              | ✓            |
| 2   | Atanassov, Jivko   |                       |                 |                 |               |                |              |
| 3   | Bafico, Javier     |                       |                 |                 |               |                |              |
| 4   | Bhat, Ramchandra   |                       |                 |                 |               |                |              |
| 5   | Borgono, Edgar     | ✓                     | ✓               | ✓               | ✓             | ✓              | ✓            |
| 6   | Bueno, Wilson      |                       |                 |                 |               |                |              |
| 7   | Campbell, David    |                       |                 |                 |               |                |              |
| 8   | Cantelmi, John     |                       |                 |                 |               |                |              |
| 9   | Cedro, Ernesto     |                       |                 |                 |               |                |              |
| 10  | Cheatham, Kenneth  |                       |                 |                 |               |                |              |
| 11  | Cipriano, Frank    |                       |                 |                 |               |                |              |
| 12  | Cole, Ian          |                       |                 |                 |               |                |              |
| 13  | DeLuna, Carlos     |                       |                 |                 |               |                |              |
| 14  | Estrada, Nelson    |                       |                 |                 |               |                |              |
| 15  | Elmasry, Mohamed   |                       |                 |                 |               |                |              |
| 16  | Fabricatore, James |                       |                 |                 |               |                |              |
| 17  | Ferreira, Jose     |                       |                 |                 |               |                |              |
| 18  | Garcia, Hector     | ✓                     | ✓               | ✓               | ✓             | N/A            | N/A          |
| 19  | Garcia, Sal        | ✓                     | ✓               | ✓               | ✓             | ✓              | ✓            |
| 20  | Gonzalez, Pablo    |                       |                 |                 |               |                |              |
| 21  | Ira, Constancio    |                       |                 |                 |               |                |              |
| 22  | Koncen, Andrew     |                       |                 |                 |               |                |              |
| 23  | Kraemer, John      | ✓                     | N/A             | ✓               | N/A           | N/A            | N/A          |
| 24  | Lane, Joshua       |                       |                 |                 |               |                |              |
| 25  | Lewis, Alvin       |                       |                 |                 |               |                |              |
| 26  | Liabach, Edward    |                       |                 |                 |               |                |              |
| 27  | McDougall, Robert  | ✓                     | N/A             | ✓               | N/A           | N/A            | N/A          |
| 28  | Medvedev, Mikhail  |                       |                 |                 |               |                |              |
| 29  | Mellijor, Philip   |                       |                 |                 |               |                |              |
| 30  | Mendoza, David     | ✓                     | ✓               | ✓               | ✓             | ✓              | ✓            |
| 31  | Ouellette, Peter   | ✓                     | ✓               | N/A             | N/A           | N/A            | N/A          |
| 32  | Papa, Paul         | ✓                     | ✓               | ✓               | ✓             | N/A            | N/A          |
| 33  | Pellegrini, Rich   |                       |                 |                 |               |                |              |
| 34  | Petrone, Lou       | ✓                     | ✓               | N/A             | N/A           | N/A            | N/A          |
| 35  | Reis, Danny        |                       |                 |                 |               |                |              |
| 36  | Rubenstein, Joe    |                       |                 |                 |               |                |              |
| 37  | Sanchez, John      |                       |                 |                 |               |                |              |
| 38  | Soares, Roger      | ✓                     | ✓               | ✓               | ✓             | ✓              | ✓            |
| 39  | Sosa, Marcelo      | ✓                     | ✓               | ✓               | ✓             | ✓              | ✓            |
| 40  | Sosa, Sergio       |                       |                 |                 |               |                |              |
| 41  | Temple, Glenn      |                       |                 |                 |               |                |              |
| 42  | Uribe, Luis        |                       |                 |                 |               |                |              |
| 43  | Uygun, Mehmet      |                       |                 |                 |               |                |              |



**HESS BAYONNE INSPECTORS APPROVED LIST**

**APPROVED INSPECTORS**

| No. | INSPECTOR          | SAMPLER<br>CLEAN OIL | SAMPLER<br>RESIDUE | BARGE<br>CLEAN OIL | BARGE<br>RESIDUE | SHIP<br>CLEAN OIL | SHIP<br>RESIDUE |
|-----|--------------------|----------------------|--------------------|--------------------|------------------|-------------------|-----------------|
| 1   | Acosta, Lenny      |                      |                    |                    |                  |                   |                 |
| 2   | Atanassov, Jivko   |                      |                    |                    |                  |                   |                 |
| 3   | Bafico, Javier     | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 4   | Bhat, Ramchandra   | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 5   | Borgono, Edgar     |                      |                    |                    |                  |                   |                 |
| 6   | Bueno, Wilson      | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 7   | Campbell, David    | ✓                    | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 8   | Cantelmi, John     |                      |                    |                    |                  |                   |                 |
| 9   | Cedro, Ernesto     |                      |                    |                    |                  |                   |                 |
| 10  | Cheatham, Kenneth  | ✓                    | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 11  | Cipriano, Frank    |                      |                    |                    |                  |                   |                 |
| 12  | Cole, Ian          |                      |                    |                    |                  |                   |                 |
| 13  | DeLuna, Carlos     |                      |                    |                    |                  |                   |                 |
| 14  | Elmasry, Mohamed   |                      |                    |                    |                  |                   |                 |
| 15  | Estrada, Nelson    | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 16  | Fabricatore, James |                      |                    |                    |                  |                   |                 |
| 17  | Ferreira, Jose     | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 18  | Garcia, Hector     |                      |                    |                    |                  |                   |                 |
| 19  | Garcia, Sal        | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 20  | Gonzalez, Pablo    | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 21  | Ira, Constancio    |                      |                    |                    |                  |                   |                 |
| 22  | Koncen, Andrew     |                      |                    |                    |                  |                   |                 |
| 23  | Kraemer, John      |                      |                    |                    |                  |                   |                 |
| 24  | Lane, Joshua       |                      |                    |                    |                  |                   |                 |
| 25  | Lewis, Alvin       |                      |                    |                    |                  |                   |                 |
| 26  | Liabach, Edward    |                      |                    |                    |                  |                   |                 |
| 27  | McDougall, Robert  |                      |                    |                    |                  |                   |                 |
| 28  | Medvedev, Mikhail  | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 29  | Mellijor, Philip   | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 30  | Mendoza, David     | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 31  | Ouellette, Peter   | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 32  | Papa, Paul         |                      |                    |                    |                  |                   |                 |
| 33  | Pellegrini, Rich   |                      |                    |                    |                  |                   |                 |
| 34  | Petrone, Lou       | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 35  | Reis, Danny        | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 36  | Rubenstein, Joe    |                      |                    |                    |                  |                   |                 |
| 37  | Sanchez, John      |                      |                    |                    |                  |                   |                 |
| 38  | Soares, Roger      | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 39  | Sosa, Marcelo      |                      |                    |                    |                  |                   |                 |
| 40  | Sosa, Sergio       | ✓                    | ✓                  | ✓                  | N/A              | N/A               | N/A             |
| 41  | Temple, Glenn      | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 42  | Uribe, Luis        | ✓                    | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 43  | Uygun, Mehmet      |                      |                    |                    |                  |                   |                 |



**HESS PORT READING INSPECTORS APPROVED LIST**

|     |                    | = APPROVED INSPECTORS |                    |                    |                  |                   |                 |
|-----|--------------------|-----------------------|--------------------|--------------------|------------------|-------------------|-----------------|
| No. | INSPECTOR          | SAMPLER<br>CLEAN OIL  | SAMPLER<br>RESIDUE | BARGE<br>CLEAN OIL | BARGE<br>RESIDUE | SHIP<br>CLEAN OIL | SHIP<br>RESIDUE |
| 1   | Acosta, Lenny      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 2   | Atanassov, Jivko   |                       |                    |                    |                  |                   |                 |
| 3   | Bafico, Javier     |                       |                    |                    |                  |                   |                 |
| 4   | Bhat, Ramchandra   |                       |                    |                    |                  |                   |                 |
| 5   | Borgono, Edgar     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 6   | Bueno, Wilson      | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 7   | Campbell, David    |                       |                    |                    |                  |                   |                 |
| 8   | Cantelmi, John     |                       |                    |                    |                  |                   |                 |
| 9   | Cedro, Ernesto     |                       |                    |                    |                  |                   |                 |
| 10  | Cheatham, Kenneth  |                       |                    |                    |                  |                   |                 |
| 11  | Cipriano, Frank    |                       |                    |                    |                  |                   |                 |
| 12  | Cole, Ian          |                       |                    |                    |                  |                   |                 |
| 13  | DeLuna, Carlos     |                       |                    |                    |                  |                   |                 |
| 14  | Elmasry, Mohamed   | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 15  | Estrada, Nelson    |                       |                    |                    |                  |                   |                 |
| 16  | Fabricatore, James |                       |                    |                    |                  |                   |                 |
| 17  | Ferreira, Jose     | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 18  | Garcia, Hector     | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 19  | Garcia, Sal        | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 20  | Gonzalez, Pablo    |                       |                    |                    |                  |                   |                 |
| 21  | Ira, Constanancio  |                       |                    |                    |                  |                   |                 |
| 22  | Koncen, Andrew     |                       |                    |                    |                  |                   |                 |
| 23  | Kraemer, John      |                       |                    |                    |                  |                   |                 |
| 24  | Lane, Joshua       |                       |                    |                    |                  |                   |                 |
| 25  | Lewis, Alvin       |                       |                    |                    |                  |                   |                 |
| 26  | Liabach, Edward    |                       |                    |                    |                  |                   |                 |
| 27  | McDougall, Robert  |                       |                    |                    |                  |                   |                 |
| 28  | Medvedev, Mikhail  | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 29  | Mellijor, Philip   |                       |                    |                    |                  |                   |                 |
| 30  | Mendoza, David     |                       |                    |                    |                  |                   |                 |
| 31  | Ouellette, Peter   | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 32  | Papa, Paul         |                       |                    |                    |                  |                   |                 |
| 33  | Pellegrini, Rich   |                       |                    |                    |                  |                   |                 |
| 34  | Petrone, Lou       | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 35  | Reis, Danny        |                       |                    |                    |                  |                   |                 |
| 36  | Rubenstein, Joe    |                       |                    |                    |                  |                   |                 |
| 37  | Sanchez, John      |                       |                    |                    |                  |                   |                 |
| 38  | Soares, Roger      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 39  | Sosa, Marcelo      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 40  | Sosa, Sergio       | ✓                     | ✓                  | ✓                  | N/A              | N/A               | N/A             |
| 41  | Temple, Glenn      |                       |                    |                    |                  |                   |                 |
| 42  | Uribe, Luis        |                       |                    |                    |                  |                   |                 |
| 43  | Uygun, Mehmet      |                       |                    |                    |                  |                   |                 |



**IMTT INSPECTORS APPROVED LIST**

|     |                    | = APPROVED INSPECTORS |                    |                    |                  |                   |                 |
|-----|--------------------|-----------------------|--------------------|--------------------|------------------|-------------------|-----------------|
| No. | INSPECTOR          | SAMPLER<br>CLEAN OIL  | SAMPLER<br>RESIDUE | BARGE<br>CLEAN OIL | BARGE<br>RESIDUE | SHIP<br>CLEAN OIL | SHIP<br>RESIDUE |
| 1   | Acosta, Lenny      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 2   | Atanassov, Jivko   |                       |                    |                    |                  |                   |                 |
| 3   | Bafico, Javier     | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 4   | Bhat, Ramchandra   |                       |                    |                    |                  |                   |                 |
| 5   | Borgono, Edgar     |                       |                    |                    |                  |                   |                 |
| 6   | Bueno, Wilson      | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 7   | Campbell, David    |                       |                    |                    |                  |                   |                 |
| 8   | Canteimi, John     |                       |                    |                    |                  |                   |                 |
| 9   | Cedro, Ernesto     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 10  | Cheatham, Kenneth  | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 11  | Cipriano, Frank    |                       |                    |                    |                  |                   |                 |
| 12  | Cole, Ian          |                       |                    |                    |                  |                   |                 |
| 13  | DeLuna, Carlos     |                       |                    |                    |                  |                   |                 |
| 14  | Elmasry, Mohamed   | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 15  | Estrada, Nelson    | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 16  | Fabricatore, James |                       |                    |                    |                  |                   |                 |
| 17  | Ferreira, Jose     | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 18  | Garcia, Hector     | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 19  | Garcia, Sal        | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 20  | Gonzalez, Pablo    | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 21  | Ira, Constancio    | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 22  | Koncen, Andrew     | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 23  | Kraemer, John      |                       |                    |                    |                  |                   |                 |
| 24  | Lane, Joshua       |                       |                    |                    |                  |                   |                 |
| 25  | Lewis, Alvin       | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 26  | Liabach, Edward    |                       |                    |                    |                  |                   |                 |
| 27  | McDougall, Robert  |                       |                    |                    |                  |                   |                 |
| 28  | Medvedev, Mikhail  | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 29  | Mellijor, Philip   | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 30  | Mendoza, David     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 31  | Ouellette, Peter   | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 32  | Papa, Paul         |                       |                    |                    |                  |                   |                 |
| 33  | Pellegrini, Rich   | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 34  | Petrone, Lou       | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 35  | Reis, Danny        | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 36  | Rubenstein, Joe    | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 37  | Sanchez, John      |                       |                    |                    |                  |                   |                 |
| 38  | Soares, Roger      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 39  | Sosa, Marcelo      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 40  | Sosa, Sergio       | ✓                     | ✓                  | ✓                  | N/A              | N/A               | N/A             |
| 41  | Temple, Glenn      | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 42  | Uribe, Luis        | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 43  | Uygun, Mehmet      |                       |                    |                    |                  |                   |                 |



**KMI INSPECTORS APPROVED LIST**

|     |                    | = APPROVED INSPECTORS |                    |                    |                  |                   |                 |
|-----|--------------------|-----------------------|--------------------|--------------------|------------------|-------------------|-----------------|
| No. | INSPECTOR          | SAMPLER<br>CLEAN OIL  | SAMPLER<br>RESIDUE | BARGE<br>CLEAN OIL | BARGE<br>RESIDUE | SHIP<br>CLEAN OIL | SHIP<br>RESIDUE |
| 1   | Acosta, Lenny      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 2   | Atanassov, Jivko   |                       |                    |                    |                  |                   |                 |
| 3   | Bafico, Javier     | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 4   | Bhat, Ramchandra   | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 5   | Borgono, Edgar     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 6   | Bueno, Wilson      | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 7   | Campbell, David    | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 8   | Canteimi, John     | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 9   | Cedro, Ernesto     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 10  | Cheatham, Kenneth  | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 11  | Cipriano, Frank    |                       |                    |                    |                  |                   |                 |
| 12  | Cole, Ian          |                       |                    |                    |                  |                   |                 |
| 13  | DeLuna, Carlos     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 14  | Elmasry, Mohamed   | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 15  | Estrada, Nelson    | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 16  | Fabricatore, James | ✓                     | N/A                | ✓                  | N/A              | N/A               | N/A             |
| 17  | Ferreira, Jose     | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 18  | Garcia, Hector     | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 19  | Garcia, Sal        | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 20  | Gonzalez, Pablo    | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 21  | Ira, Constancio    | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 22  | Koncen, Andrew     | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 23  | Kraemer, John      | ✓                     | N/A                | ✓                  | N/A              | N/A               | N/A             |
| 24  | Lane, Joshua       |                       |                    |                    |                  |                   |                 |
| 25  | Lewis, Alvin       | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 26  | Liabach, Edward    |                       |                    |                    |                  |                   |                 |
| 27  | McDougall, Robert  | ✓                     | N/A                | ✓                  | N/A              | N/A               | N/A             |
| 28  | Medvedev, Mikhail  | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 29  | Mellijor, Philip   | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 30  | Mendoza, David     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 31  | Ouellette, Peter   | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 32  | Papa, Paul         | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 33  | Pellegrini, Rich   |                       |                    |                    |                  |                   |                 |
| 34  | Petrone, Lou       | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 35  | Reis, Danny        | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 36  | Rubenstein, Joe    | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 37  | Sanchez, John      |                       |                    |                    |                  |                   |                 |
| 38  | Soares, Roger      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 39  | Sosa, Marcelo      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 40  | Sosa, Sergio       | ✓                     | ✓                  | ✓                  | N/A              | N/A               | N/A             |
| 41  | Temple, Glenn      | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 42  | Uribe, Luis        | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 43  | Uygun, Mehmet      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | N/A             |



**MOTIVA INSPECTORS APPROVED LIST**

|     |                    | = APPROVED INSPECTORS |                    |                    |                  |                   |                 |
|-----|--------------------|-----------------------|--------------------|--------------------|------------------|-------------------|-----------------|
| No. | INSPECTOR          | SAMPLER<br>CLEAN OIL  | SAMPLER<br>RESIDUE | BARGE<br>CLEAN OIL | BARGE<br>RESIDUE | SHIP<br>CLEAN OIL | SHIP<br>RESIDUE |
| 1   | Acosta, Lenny      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 2   | Atanassov, Jivko   |                       |                    |                    |                  |                   |                 |
| 3   | Bafico, Javier     | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 4   | Bhat, Ramchandra   | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 5   | Borgono, Edgar     | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 6   | Bueno, Wilson      |                       |                    |                    |                  |                   |                 |
| 7   | Campbell, David    |                       |                    |                    |                  |                   |                 |
| 8   | Cantelmi, John     |                       |                    |                    |                  |                   |                 |
| 9   | Cedro, Ernesto     |                       |                    |                    |                  |                   |                 |
| 10  | Cheatham, Kenneth  | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 11  | Cipriano, Frank    |                       |                    |                    |                  |                   |                 |
| 12  | Cole, Ian          |                       |                    |                    |                  |                   |                 |
| 13  | DeLuna, Carlos     |                       |                    |                    |                  |                   |                 |
| 14  | Elmasry, Mohamed   |                       |                    |                    |                  |                   |                 |
| 15  | Estrada, Nelson    |                       |                    |                    |                  |                   |                 |
| 16  | Fabricatore, James |                       |                    |                    |                  |                   |                 |
| 17  | Ferreira, Jose     | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 18  | Garcia, Hector     |                       |                    |                    |                  |                   |                 |
| 19  | Garcia, Sal        | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 20  | Gonzalez, Pablo    |                       |                    |                    |                  |                   |                 |
| 21  | Ira, Constancio    |                       |                    |                    |                  |                   |                 |
| 22  | Koncen, Andrew     | ✓                     | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 23  | Kraemer, John      |                       |                    |                    |                  |                   |                 |
| 24  | Lane, Joshua       |                       |                    |                    |                  |                   |                 |
| 25  | Lewis, Alvin       | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 26  | Liabach, Edward    |                       |                    |                    |                  |                   |                 |
| 27  | McDougall, Robert  |                       |                    |                    |                  |                   |                 |
| 28  | Medvedev, Mikhail  | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 29  | Melijor, Philip    |                       |                    |                    |                  |                   |                 |
| 30  | Mendoza, David     |                       |                    |                    |                  |                   |                 |
| 31  | Ouellette, Peter   | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 32  | Papa, Paul         |                       |                    |                    |                  |                   |                 |
| 33  | Pellegrini, Rich   |                       |                    |                    |                  |                   |                 |
| 34  | Petrone, Lou       | ✓                     | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 35  | Reis, Danny        |                       |                    |                    |                  |                   |                 |
| 36  | Rubenstein, Joe    |                       |                    |                    |                  |                   |                 |
| 37  | Sanchez, John      |                       |                    |                    |                  |                   |                 |
| 38  | Soares, Roger      |                       |                    |                    |                  |                   |                 |
| 39  | Sosa, Marcelo      | ✓                     | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 40  | Sosa, Sergio       | ✓                     | ✓                  | ✓                  | N/A              | N/A               | N/A             |
| 41  | Temple, Glenn      |                       |                    |                    |                  |                   |                 |
| 42  | Uribe, Luis        |                       |                    |                    |                  |                   |                 |
| 43  | Uygun, Mehmet      |                       |                    |                    |                  |                   |                 |



**PHILLIPS 66 INSPECTORS APPROVED LIST**

**APPROVED INSPECTORS**

| No. | INSPECTOR          | SAMPLER<br>CLEAN OIL | SAMPLER<br>RESIDUE | BARGE<br>CLEAN OIL | BARGE<br>RESIDUE | SHIP<br>CLEAN OIL | SHIP<br>RESIDUE |
|-----|--------------------|----------------------|--------------------|--------------------|------------------|-------------------|-----------------|
| 1   | Acosta, Lenny      | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 2   | Atanassov, Jivko   |                      |                    |                    |                  |                   |                 |
| 3   | Bafico, Javier     |                      |                    |                    |                  |                   |                 |
| 4   | Bhat, Ramchandra   |                      |                    |                    |                  |                   |                 |
| 5   | Borgono, Edgar     |                      |                    |                    |                  |                   |                 |
| 6   | Bueno, Wilson      |                      |                    |                    |                  |                   |                 |
| 7   | Campbell, David    |                      |                    |                    |                  |                   |                 |
| 8   | Cantelmi, John     |                      |                    |                    |                  |                   |                 |
| 9   | Cedro, Ernesto     |                      |                    |                    |                  |                   |                 |
| 10  | Cheatham, Kenneth  |                      |                    |                    |                  |                   |                 |
| 11  | Cipriano, Frank    |                      |                    |                    |                  |                   |                 |
| 12  | Cole, Ian          |                      |                    |                    |                  |                   |                 |
| 13  | DeLuna, Carlos     |                      |                    |                    |                  |                   |                 |
| 14  | Elmasry, Mohamed   |                      |                    |                    |                  |                   |                 |
| 15  | Estrada, Nelson    |                      |                    |                    |                  |                   |                 |
| 16  | Fabricatore, James |                      |                    |                    |                  |                   |                 |
| 17  | Ferreira, Jose     |                      |                    |                    |                  |                   |                 |
| 18  | Garcia, Hector     | ✓                    | ✓                  | ✓                  | ✓                | N/A               | N/A             |
| 19  | Garcia, Sal        | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 20  | Gonzalez, Pablo    |                      |                    |                    |                  |                   |                 |
| 21  | Ira, Constancio    | ✓                    | ✓                  | ✓                  | ✓                | ✓                 | ✓               |
| 22  | Koncen, Andrew     |                      |                    |                    |                  |                   |                 |
| 23  | Kraemer, John      |                      |                    |                    |                  |                   |                 |
| 24  | Lane, Joshua       |                      |                    |                    |                  |                   |                 |
| 25  | Lewis, Alvin       |                      |                    |                    |                  |                   |                 |
| 26  | Liabach, Edward    |                      |                    |                    |                  |                   |                 |
| 27  | McDougall, Robert  |                      |                    |                    |                  |                   |                 |
| 28  | Medvedev, Mikhail  |                      |                    |                    |                  |                   |                 |
| 29  | Melijor, Philip    |                      |                    |                    |                  |                   |                 |
| 30  | Mendoza, David     |                      |                    |                    |                  |                   |                 |
| 31  | Ouellette, Peter   | ✓                    | ✓                  | N/A                | N/A              | N/A               | N/A             |
| 32  | Papa, Paul         |                      |                    |                    |                  |                   |                 |
| 33  | Pellegrini, Rich   |                      |                    |                    |                  |                   |                 |
| 34  | Petrone, Lou       |                      |                    |                    |                  |                   |                 |
| 35  | Reis, Danny        |                      |                    |                    |                  |                   |                 |
| 36  | Rubenstein, Joe    |                      |                    |                    |                  |                   |                 |
| 37  | Sanchez, John      |                      |                    |                    |                  |                   |                 |
| 38  | Soares, Roger      |                      |                    |                    |                  |                   |                 |
| 39  | Sosa, Marcelo      |                      |                    |                    |                  |                   |                 |
| 40  | Sosa, Sergio       |                      |                    |                    |                  |                   |                 |
| 41  | Temple, Glenn      |                      |                    |                    |                  |                   |                 |
| 42  | Uribe, Luis        |                      |                    |                    |                  |                   |                 |
| 43  | Uygun, Mehmet      |                      |                    |                    |                  |                   |                 |

**ANEXO 10. FORMATOS DE AUDITORÍA INTERNA DE LOS EQUIPOS DE  
CADA INSPECTOR**



Name \_\_\_\_\_ Date \_\_\_\_\_

| <b>GAUGING EQUIPMENT</b> |                    |
|--------------------------|--------------------|
| Inn Tape _____           | Out Tape _____     |
| Inn Bob _____            | Out Bob _____      |
| Ground Cable _____       | Ground Cable _____ |
| Comments _____           |                    |
| _____                    |                    |
| _____                    |                    |

| <b>SAMPLING EQUIPMENT</b>            |  |
|--------------------------------------|--|
| 6 Oil Cage Sampler _____             |  |
| Clean Oil Cage Sampler _____         |  |
| Distillate Cage Sampler _____        |  |
| Methanol Cage Sampler _____          |  |
| Methanol Rope _____                  |  |
| Other Cage Sampler _____             |  |
| Bacon Bomb/ Ext. Rods _____          |  |
| Bottles/Caps - Properly Stored _____ |  |
| Buckets / Lids _____                 |  |
| Comments _____                       |  |

| <b>OTHER EQUIPMENT</b>       |  |
|------------------------------|--|
| Cupcase / Woodback _____     |  |
| Thermoprobe _____            |  |
| NIST Field Thermometer _____ |  |
| Comments _____               |  |
| _____                        |  |
| _____                        |  |

| <b>RESPIRATORS/ H2S/ DRAGER KIT</b> |  |
|-------------------------------------|--|
| Facial Hair _____                   |  |
| H2S Meter _____                     |  |
| Full Face mask _____                |  |
| Half Face mask _____                |  |
| Fit Test Card _____                 |  |
| Drager Kit _____                    |  |
| Stored Properly _____               |  |
| Comments _____                      |  |
| _____                               |  |
| _____                               |  |

| <b>PERSONAL PROTECTIVE EQUIPMENT</b> |  |
|--------------------------------------|--|
| Regular Life Vest _____              |  |
| Ultra 3000 Life Vest _____           |  |
| Hard Hat _____                       |  |
| Headlight _____                      |  |
| Harness _____                        |  |
| Goggles _____                        |  |
| Rain Boots _____                     |  |
| Safety Glasses _____                 |  |
| Safety Shoes _____                   |  |
| Flashlight _____                     |  |
| Rain Suit _____                      |  |

| <b>PROVIDED ITEMS</b> |
|-----------------------|
|                       |
|                       |
|                       |
|                       |
|                       |
|                       |
|                       |
|                       |
|                       |
|                       |

| <b>CERTIFICATES</b>     |  |
|-------------------------|--|
| NIST Field Therm. _____ |  |
| Thermoprobe Cert. _____ |  |
| Innage Tape _____       |  |
| Outage Tape _____       |  |
| MSDS / 2012 ERGB _____  |  |
| <b>VEHICLE</b>          |  |
| DOT Box _____           |  |
| Lights _____            |  |
| Tires _____             |  |
| General Condition _____ |  |
| Comments _____          |  |
| _____                   |  |
| _____                   |  |

Checked By \_\_\_\_\_

Reviewed by \_\_\_\_\_

| <b>ADDITIONAL COMMENTS</b> |
|----------------------------|
|                            |
|                            |
|                            |
|                            |
|                            |
|                            |
|                            |
|                            |
|                            |
|                            |



**Inspectors Car Audit**

| No. | Employee Name    | Date Audited | Geog. & Sampling | Exhaust | PPE & Assistance | VISIS | ENG 2004 & Certificate | Items Provided   | Issues Found  | Corrective Actions        |
|-----|------------------|--------------|------------------|---------|------------------|-------|------------------------|--|---|---------------------------|
| 1   | Arzola, Jerry    | 04/30/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 2   | Bajica, Javier   | 04/24/12     | ✓                | ✓       | ✓                | ✓     | ✓                      | One cage sampler for NG OIL.   | The car was in good condition, clean and organized. | Keep doing the good work. |
| 3   | Bhat, Ramchandra | 04/13/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition and clean.            | Keep doing the good work. |
| 4   | Borgosa, Edgar   | 04/14/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 5   | Burns, Wilson    | 04/18/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 6   | Campbell, David  | 04/25/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition.                      | Keep doing the good work. |
| 7   | Carriker, Ash    | 04/27/12     | ✓                | ✓       | ✓                | ✓     | ✓                      | A headlight, a hand flat and goggles.                                      | The car was in good condition, clean and organized. | Keep doing the good work. |
| 8   | Cedeno, Ernesto  | 04/24/12     | ✓                | ✓       | ✓                | ✓     | ✓                      | Danger kit tubes (one case 5-60 ppm, one case 1-200 ppm and 100-2000 ppm). | The car was in good condition, clean and organized. | Keep doing the good work. |
| 9   | Chak, Brian      | 04/11/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition and organized.        | Keep doing the good work. |
| 10  | Cole, Ian        | 04/23/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition and organized.        | Keep doing the good work. |
| 11  | De Luna, Carlos  | 04/25/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 12  | Elmory, Mohamed  | 04/10/12     | ✓                | ✓       | ✓                | ✓     | ✓                      | A hand flat and one headlight.   | The car was in good condition, clean and organized. | Keep doing the good work. |
| 13  | Elid, Mohamed    | 04/13/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 14  | Fabrizio, James  | 04/11/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 15  | Garcia, Hector   | 04/13/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition and organized.        | Keep doing the good work. |
| 16  | Garcia, Salvador | 04/19/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 17  | Evans, Andrew    | 04/19/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 18  | Kramer, John     | 04/25/12     | ✓                | ✓       | ✓                | ✓     | ✓                      | A copy of HI Test Card.  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 19  | Lane, Andrew     | 04/10/12     | ✓                | ✓       | ✓                | ✓     | ✓                      |  | The car was in good condition and organized.        | Keep doing the good work. |



Inspectors Car Audit

| No. | Employee Name      | Date Performing | Gauging & Sampling | Equipment | PPE & Respirators | Vehicle | ERG 2008 & Certificates | Items Provided   | Issues Found  | Corrective Actions        |
|-----|--------------------|-----------------|--------------------|-----------|-------------------|---------|-------------------------|--|---|---------------------------|
| 20  | Lewis, Alvin       | 04/27/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition and organized.        | Keep doing the good work. |
| 21  | Liabach, Edward    | 04/30/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 22  | McDougall, Robert  | 04/03/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 23  | Mendoza, David     | 04/11/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition and organized.        | Keep doing the good work. |
| 25  | Ouellette, Peter   | 04/13/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition, clean and organized. | Keep doing the good work. |
| 26  | Papa, Paul         | 04/04/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       | One flashlight.  | The car was in good condition.                      | Keep doing the good work. |
| 27  | Pellegrini, Rich   | 04/03/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition and organized.        | Keep doing the good work. |
| 28  | Petrone, Louis     | 04/09/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition and organized.        | Keep doing the good work. |
| 29  | Rubenstein, Joseph | 04/24/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       | One Headlight, a cork and 3 batteries C.                                   | The car was in good condition, clean and organized. | Keep doing the good work. |
| 30  | Sanchez, John      | 04/23/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       | Drager kit tubes (one case 5-60 ppm and one case 1-200 ppm).               | The car was in good condition, clean and organized. | Keep doing the good work. |
| 31  | Soares, Roger      | 04/25/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       | A copy of Thermoprobe Certificate.   | The car was in good condition, clean and organized. | Keep doing the good work. |
| 32  | Sosa, Marcelo      | 04/04/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition and clean.            | Keep doing the good work. |
| 33  | Sosa, Sergio       | 04/27/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition and organized.        | Keep doing the good work. |
| 34  | Uygun, Mehmet      | 04/25/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       | Drager kit tubes (one case 5-60 ppm, one case 1-200 ppm and 100-2000 ppm). | The car was in good condition, clean and organized. | Keep doing the good work. |
| 35  | Vici, Michael      | 04/11/12        | ✓                  | ✓         | ✓                 | ✓       | ✓                       |  | The car was in good condition and organized.        | Keep doing the good work. |

**ANEXO 11. CONTROL DE LA EXPIRACIÓN DE LA LICENCIA DE CONducIR, SEGURO DEL AUTO Y PLACA DEL VEHÍCULO QUE CONducEN**



|    | <b>Name</b>           | <b>Driver License #</b>     | <b>Expiration Date</b> |
|----|-----------------------|-----------------------------|------------------------|
| 1  | Acosta, Lenyn         | A1715 45866 04632 NJ        | 31/08/2016             |
| 2  | Atanassov, Jivko      | A8115 40274 02702 NJ        | 31/08/2016             |
| 3  | Bafico, Javier        | B0126 39000 07672 NJ        | 30/09/2015             |
| 4  | Ramchandra, Bhat      | B3250 63900 06471 NJ        | 1/01/2014              |
| 5  | Borgono, Edgar        | B6595 18861 09805 NJ        | 30/04/2014             |
| 6  | Bueno, Wilson         | B9112 78700 03752 NJ        | 31/10/2014             |
| 7  | Campbell, David       | C0368 15677 10692 NJ        | 31/10/2016             |
| 8  | Cantelmi, John        | 825 253 526 NY              | 12/03/2019             |
| 9  | Cedro, Ernesto        | C2152 23464 06481 NJ        | 31/08/2016             |
| 10 | Cheatham, Kenneth     | C3284 43165 08672 NJ        | 30/06/2014             |
| 11 | Cipriano, Frank       | C4577 26779 02812 NJ        | 31/08/2013             |
| 12 | Cole, Ian             | 538 902 875 NY              | 9/02/2016              |
| 13 | DeLuna, Carlos        | G9538 11061 05452 NJ        | 30/09/2014             |
| 14 | Elmasry, Mohamed      | E5486 56061 06722 NJ        | 31/12/2014             |
| 15 | Estrada, Nelson       | E8072 58764 04812 NJ        | 31/12/2013             |
| 16 | Fabricatore, James    | F0020 38367 05712 NJ        | 30/06/2016             |
| 17 | Ferreira, Jose        | F2741 41074 04752 NJ        | 31/05/2015             |
| 18 | <b>Garcia, Hector</b> | <b>G0554 32000 01682 NJ</b> | <b>31/10/2012</b>      |
| 19 | Garcia, Salvador      | G0554 68600 08601 NJ        | 31/03/2014             |
| 20 | Gonzalez, Pablo       | 940 264 446 NY              | 8/11/2015              |
| 21 | Ira, Constancio       | 30 221 683 PA               | 19/11/2013             |
| 22 | Koncen, Andrew        | K6381 04283 08874 NJ        | 31/08/2016             |
| 23 | Kraemer, John         | K7143 40767 02712 NJ        | 31/03/2016             |
| 24 | Lane, Joshua          | 162 460 189 NY              | 10/10/2016             |
| 25 | Lewis, Alvin          | 601 575 831 NY              | 7/11/2018              |
| 26 | Liabach, Edward       | 604 832 405 NY              | 25/01/2020             |
| 27 | McDougall, Robert     | M1210 65871 02634 NJ        | 31/05/2016             |
| 28 | Medvedev, Mikhail     | M2154 54700 08672 NJ        | 31/08/2015             |
| 29 | Mellijor, Philip      | M426-6636-0150 IL           | 26/05/2014             |
| 30 | Mendoza, David        | M2516 15682 07752 NJ        | 31/07/2016             |
| 31 | Ouellette, Peter      | O9111 62577 06604 NJ        | 31/07/2016             |
| 32 | Papa, Paul            | 594 911 931 NY              | 18/06/2018             |
| 33 | Pellegrini, Rich      | P2394 65566 02592 NJ        | 31/03/2014             |
| 34 | Petrone, Louis        | P2869 48861 12782 NJ        | 31/01/2016             |
| 35 | Reis, Danny           | R2300 15474 12832 NJ        | 31/12/2012             |
| 36 | Rubenstein, Joe       | R9022 41064 06872 NJ        | 30/09/2016             |
| 37 | Sanchez, John         | 764 448 244 NY              | 9/01/2018              |
| 38 | <b>Soares, Roger</b>  | <b>S6007 66400 09622 NJ</b> | <b>30/11/2012</b>      |
| 39 | Sosa, Marcelo         | S6685 51773 02732 NJ        | 30/11/2014             |
| 40 | Sosa, Sergio          | S6685 70076 06856 NJ        | 31/01/2016             |
| 41 | Temple, Glenn         | T2482 29261 10822 NJ        | 31/12/2013             |
| 42 | Uribe, Luis           | U7387 49466 07742 NJ        | 31/03/2013             |
| 43 | Uygun, Mehmet         | U9647 53762 01614 NJ        | 31/08/2014             |



|    | <u>Name</u>               | <u>Policy #</u>         | <u>Company</u>              | <u>Expiration Date</u> |
|----|---------------------------|-------------------------|-----------------------------|------------------------|
| 1  | Acosta, Lenyn             | 0117-56-60-00           | Geico                       | 14/02/2013             |
| 2  | Atanassov, Jivko          | 4244-86-34-21           | Geico                       | 25/03/2013             |
| 3  | Bafico, Javier            | 17686390-1              | Progressive                 | 26/03/2013             |
| 4  | Ramchandra, Bhat          | 4140-38-49-93           | Geico                       | 4/03/2013              |
| 5  | <b>Borgono, Edgar</b>     | <b>065 2695-E30-30</b>  | <b>State Farm</b>           | <b>30/11/2012</b>      |
| 6  | <b>Bueno, Wilson</b>      | <b>4022-00-94-37</b>    | <b>Geico</b>                | <b>7/11/2012</b>       |
| 7  | Campbell, David           | 939026259               | Allstate                    | 6/01/2013              |
| 8  | <b>Cantelmi, John</b>     | <b>058 6175-E02-32C</b> | <b>New York State Ins.</b>  | <b>2/11/2012</b>       |
| 9  | Cedro, Ernesto            | X33 5838-C06-30M        | State Farm                  | 6/03/2013              |
| 10 | Ceatham, Kenneth          | 17529643-9              | Progressive                 | 30/12/2012             |
| 11 | Cipriano, Frank           | TCA00001004835          | Teachers Auto Insurance     | 17/03/2013             |
| 12 | Cole, Ian                 | 17570-89-67             | 346 Truck Ins. Exchange     | 9/12/2012              |
| 13 | DeLuna, Carlos            | 2119 95 96              | 21st Century Centennial     | 12/02/2013             |
| 14 | Elmasry, Mohamed          | 4072-71-44-49           | Geico                       | 25/01/2013             |
| 15 | Estrada, Nelson           | 65919541-3              | Progressive                 | 22/12/2012             |
| 16 | <b>Fabricatore, James</b> | <b>4197-02-12-58</b>    | <b>Geico</b>                | <b>3/12/2012</b>       |
| 17 | Ferreira, Jose            | 061 5017-B11-30C        | State Farm                  | 11/02/2013             |
| 18 | Garcia, Hector            | 4220-83-01-88           | Geico                       | 28/01/2013             |
| 19 | Garcia, Salvador          | HPA125AA613974          | Plymouth Rock               | 18/04/2013             |
| 20 | Gonzalez, Pablo           | 9 33 689051             | Allstate                    | 26/12/2012             |
| 21 | Ira, Constanancio         | A05-281-658143-70 2 6   | Liberty Mutual              | 15/01/2013             |
| 22 | Koncen, Andrew            | 4226-48-06-99           | Geico                       | 1/04/2013              |
| 23 | Kraemer, John             | 4038-84-80-00           | Geico                       | 19/03/2013             |
| 24 | Lane, Joshua              | 46269605-5              | Progressive                 | 22/02/2013             |
| 25 | Lewis, Alvin              | 9 13 474292             | Allstate                    | 21/12/2012             |
| 26 | <b>Liabach, Edward</b>    | <b>810-8A961789</b>     | <b>The Charter Oak Fire</b> | <b>15/11/2012</b>      |
| 27 | McDougall, Robert         | F893000-0               | New Jersey Manufact.        | 21/04/2013             |
| 28 | Medvedev, Mikhail         | 990115311 105 1         | Fidelity & Warranty Ins.    | 20/03/2013             |
| 29 | Mellijor, Philip          | 9 02 507484             | Allstate                    | 22/01/2013             |
| 30 | Mendoza, David            | 50978330-5              | Progressive                 | 22/02/2013             |
| 31 | Ouellette, Peter          | 990148218               | Fidelity & Warranty Ins.    | 9/04/2013              |
| 32 | Papa, Paul                | 4112-11-48-24           | Geico                       | 17/04/2013             |
| 33 | Pellegrini, Rich          | 4H1A66837               | Skylands                    | 2/08/2013              |
| 34 | Petrone, Louis            | ANY-8799485             | The Hanover                 | 3/09/2013              |
| 35 | Reis, Danny               | 02053 94 67C            | USAA Casualty               | 19/12/2012             |
| 36 | <b>Rubenstein, Joe</b>    | <b>66124392-4</b>       | <b>Progressive</b>          | <b>22/11/2012</b>      |
| 37 | Sanchez, John             | 66 31 P 284186          | Nationwide Mutual           | 24/02/2013             |
| 38 | Soares, Roger             | 028380809-0             | Metropolitan                | 13/01/2013             |
| 39 | Sosa, Marcelo             | 10811057                | 21st Century Assurance      | 12/03/2013             |
| 40 | Sosa, Sergio              | 9 09 914303             | Allstate                    | 22/04/2013             |
| 41 | Temple, Glenn             | 9 39 013045             | Allstate                    | 28/04/2013             |
| 42 | <b>Uribe, Luis</b>        | <b>F884406-0</b>        | <b>New Jersey Manufact.</b> | <b>19/11/2012</b>      |
| 43 | Uygun, Mehmet             | 930829 - 22QE           | Amica Property & Ins.       | 6/08/2013              |



|    | <b>Name</b>             | <b>Plate Number</b> | <b>Registration Exp. Date</b> |
|----|-------------------------|---------------------|-------------------------------|
| 1  | Acosta, Lenyn           | D48CHX - NJ         | 31/08/2013                    |
| 2  | Atanassov, Jivko        | ZHL68B - NJ         | 30/11/2013                    |
| 3  | Bafico, Javier          | S74BBD - NJ         | 30/09/2013                    |
| 4  | Ramchandra, Bhat        | UFR94A - NJ         | 31/01/2013                    |
| 5  | Borgono, Edgar          | ZWV89Z - NJ         | 31/05/2013                    |
| 6  | Bueno, Wilson           | K17BJM- NJ          | 31/03/2013                    |
| 7  | Campbell, David         | SLK63W - NJ         | 30/04/2013                    |
| 8  | Cantelmi, John          | FMS5635 - NY        | 14/07/2013                    |
| 9  | Cedro, Ernesto          | NVY57D - NJ         | 30/04/2013                    |
| 10 | Cheatham, Kenneth       | H40CCX - NJ         | 31/05/2016                    |
| 11 | Cipriano, Frank         | ZEZ98N - NJ         | 31/10/2013                    |
| 12 | Cole, Ian               | FLJ8737 - NY        | 25/05/2013                    |
| 13 | DeLuna, Carlos          | PLM96K - NJ         | 31/08/2013                    |
| 14 | <b>Elmasry, Mohamed</b> | <b>ZKM50S - NJ</b>  | <b>30/11/2012</b>             |
| 15 | Estrada, Nelson         | VYJ37H - NJ         | 30/06/2013                    |
| 16 | Fabricatore, James      | ZXA54L - NJ         | 30/06/2013                    |
| 17 | Ferreira, Jose          | Y62CEX - NJ         | 31/07/2013                    |
| 18 | Garcia, Hector          | N84BVK - NJ         | 1/02/2013                     |
| 19 | Garcia, Salvador        | WUM16H - NJ         | 30/04/2013                    |
| 20 | Gonzalez, Pablo         | DME3680 - NY        | 12/01/2014                    |
| 21 | Ira, Constancio         | HVE2394 - PA        | 31/07/2013                    |
| 22 | Koncen, Andrew          | S67CFS - NJ         | 31/07/2013                    |
| 23 | Kraemer, John           | PAE82A - NJ         | 31/05/2013                    |
| 24 | Lane, Joshua            | EXP1527 - NY        | 21/02/2014                    |
| 25 | Lewis, Alvin            | FGW9138 - NY        | 26/05/2014                    |
| 26 | Liabach, Edward         | PDF42X - NJ         | 30/06/2013                    |
| 27 | McDougall, Robert       | W84AKN - NJ         | 31/01/2013                    |
| 28 | Medvedev, Mikhail       | X73BHL - NJ         | 31/08/2013                    |
| 29 | Mellijor, Philip        | K162351 - IL        | 31/08/2013                    |
| 30 | Mendoza, David          | ZTF71X - NJ         | 30/04/2013                    |
| 31 | <b>Ouellette, Peter</b> | <b>YK131B - NJ</b>  | <b>30/11/2012</b>             |
| 32 | Papa, Paul              | ASK1117 - NY        | 13/10/2014                    |
| 33 | Pellegrini, Rich        | YRX16A - NJ         | 31/03/2013                    |
| 34 | Petrone, Louis          | ZFR94C - NJ         | 30/11/2013                    |
| 35 | Reis, Danny             | Y53CER - NJ         | 31/05/2016                    |
| 36 | Rubenstein, Joe         | J99BZC - NJ         | 30/04/2013                    |
| 37 | Sanchez, John           | FJF8118 - NY        | 27/03/2013                    |
| 38 | Soares, Roger           | V64ARH - NJ         | 31/03/2013                    |
| 39 | Sosa, Marcelo           | VZV11M - NJ         | 31/07/2013                    |
| 40 | Sosa, Sergio            | X29CHR - NJ         | 30/06/2013                    |
| 41 | Temple, Glenn           | SCX98W - NJ         | 1/01/2013                     |
| 42 | Uribe, Luis             | ZNJ37U - NJ         | 31/01/2014                    |
| 43 | Uygun, Mehmet           | Y78ALL - NJ         | 31/01/2013                    |

**ANEXO 12. INVENTARIO DE LOS EQUIPOS DE CADA INSPECTOR,  
EQUIPOS PARA BARCOS Y APARATOS RESPIRATORIOS**



**FIELD EQUIPMENT RECEIPT AND CHECKLIST**

Inspector's Name: Salvador Garcia

Location: Linden, NJ

| ITEM   | SERIAL / ID #   | Qty    | VALUE    |
|--|-----------------|--------|----------|
| <b>Personal Protective Equipment</b>                             |                 |        |          |
| Hard Hat   |                 | 1      | \$7.25   |
| Goggles  |                 | 1      | \$10.25  |
| Safety Glasses   |                 | 1      | \$2.95   |
| Face Shield  |                 | 1      | \$1.50   |
| Ear Plugs or Headset   |                 | 1      | \$1.50   |
| Filter-Type Respirator with new Cartridge(s), BRAND: North       | 76008A/ 770030L | 1 Each | \$207.08 |
| Personal Flotation Device (Jacket Type II)                       |                 | 1      | \$180.00 |
| Electronic Hydrogen Sulfide (H2S) Monitor, BRAND: MSA Altair # 4 | 19994           | 1      | \$805.50 |
| Coveralls (NOMEX TYPE II Fire Resistant), SIZE:                  |                 | 7      |          |
| Jacket w. Liner (NOMEX TYPE II Fire Resistant), SIZE:            |                 | 2      |          |
| Gloves: Petroleum Resistant                                      |                 | 1      | \$2.22   |
| Gloves: Gasoline Resistant                                       |                 | 1      | \$6.88   |
| Gloves: Chemical (SPECIFIC) Resistant                            |                 | 1      | \$2.25   |
| Gloves: Temperature Protective                                   |                 |        |          |
| Explosion Proof Flashlight, BATTERY TYPE: C                      |                 | 1      | \$4.25   |
| Rain Suit, SIZE  |                 | 1      | \$30.00  |
| Rubber Boots, SIZE:  |                 | 1      | \$40.00  |
| Safety Shoes, SIZE:  |                 | 1      | \$80.00  |
| Headlight BATTERY TYPE: AAA                                      |                 | 1      | \$25.00  |

| ITEM                                       | SERIAL / ID # | Qty | VALUE |
|--|---------------|-----|-------|
| <b>Electronic Equipment</b>                |               |     |       |
| Cellular Telephone with Headset / Earpiece |               | 1   |       |
| Handheld PDA, BRAND:                       |               |     |       |
| Laptop Computer & Carrying Case, BRAND:    |               | 1   |       |
| Portable Printer, BRAND:                   |               | 1   |       |
| Fax Machine, BRAND:                        |               |     |       |
| Other:                                     |               |     |       |
| Other:                                     |               |     |       |
| Other:                                     |               |     |       |

| ITEM                                    | SERIAL / ID # | Qty | VALUE  |
|---|---------------|-----|--------|
| <b>Documentation / Guidelines</b>       |               |     |        |
| AmSpec Photo ID Card with Clip          |               |     |        |
| TWIC Photo ID Card with Clip            |               |     |        |
| Inspector's Tally Book                  |               | 1   | \$7.15 |
| North America Response Book, YEAR: 2012 |               | 1   | \$3.49 |
| AmSpec Safety Manual                    |               |     |        |
| AmSpec MSDS Manual                      |               |     |        |
| Other:                                  |               |     |        |
| Other:                                  |               |     |        |



**FIELD EQUIPMENT RECEIPT AND CHECKLIST**

Inspector's Name: Salvador Garcia

Location: Linden, NJ

| ITEM   | SERIAL / ID # | Qty | VALUE    |
|--|---------------|-----|----------|
| <b>Standard Measuring Equipment</b>  |               |     |          |
| Outrage Tape, Bob & Little Joe Assembly (Metric / Ft-In), LENGTH: 75' Lufkin | PM-0965       | 1   | \$261.96 |
| Innage Tape, Bob & Little Joe Assembly (Metric / Ft-In), LENGTH: 75' Lufkin  | PM-0883       | 1   | \$306.96 |
| Portable Electronic Thermometer (PET), BRAND: Isotherm Mark II               | 1C041396      | 1   | \$900.00 |
| Electronic Gauge Tape & ___ adaptors, BRAND:                                 |               |     |          |
| Cupcase Thermometer Assembly (Wood & Brass)                                  | 569279        | 1   | \$33.50  |
| Cupcase Thermometer Assembly (Zytel) for Chemicals                           |               |     |          |
| NIST Thermometer & Metal case  | 617893        | 1   | \$84.25  |
| Harness  | 244785/218424 | 1   | \$75.00  |
| Drager Kit With Tubes  |               |     | \$650.00 |

| ITEM  | SERIAL / ID # | Qty | VALUE |
|---|---------------|-----|-------|
| <b>Specialized Measuring &amp; Sampling Equipment</b>                       |               |     |       |
| Stainless Outrage Tape, Bob & Little Joe Assembly (Metric / Ft-In), LENGTH: |               |     |       |
| Stainless Innage Tape, Bob & Little Joe Assembly (Metric / Ft-In), LENGTH:  |               |     |       |
| Cupcase Thermometer Assembly (Stainless Steel)                              |               |     |       |
| Stainless Steel Quart Cage Sampler for Chemicals                            |               |     |       |
| Stainless Steel Pint Cage Sampler for Chemicals                             |               |     |       |
| Stainless Steel Zone Sampler for Chemicals                                  |               |     |       |

| ITEM  | SERIAL / ID # | Qty | VALUE    |
|---|---------------|-----|----------|
| <b>Sampling Equipment</b>                                       |               |     |          |
| Brass Quart Cage Sampler for Residual Products                  |               | 1   | \$85.00  |
| Brass Quart Cage Sampler for Clean Oil Products                 |               | 1   | \$85.00  |
| Brass Quart Cage Sampler for Distillate Oil Products            |               | 1   | \$85.00  |
| Brass Pint Cage Sampler for Residual Products                   |               |     |          |
| Brass Pint Cage Sampler for Clean Oil Products                  |               |     |          |
| Bacon Bomb Sampler (Pint or Quart) with ___ 5___ Extension Rods |               | 1   | \$370.75 |
| Pencil Type   |               |     |          |
| R.O.B. Type   |               |     |          |
| Zone Type   |               |     |          |
| Lead Weight for Bottle Sampling                                 |               |     |          |
| Other:  |               |     |          |
| Other:  |               |     |          |
| Sample Bottle Carrier   |               | 1   | \$119.00 |
| Sample Bottle Transportation Chest with applicable Safety Signs | 12Qt          | 1   | \$145.00 |

Pursuant to the signed Equipment Acknowledge Receipt included in the Application for Employment, In consideration for compensation I receive and continuing to maintain my employment with AmSpec Services LLC, it is understood that I have been assigned equipment and I am fully responsible for those items while under my care, custody & control during the time employed with the Company. I understand that I will be required to return the assigned equipment by request of my Manager or upon termination of my employment in the same condition as received, allowing for normal wear and tear. I understand that my final pay check may be held until such time as assigned equipment is returned, and that deductions will be made in order to recover the costs of items not returned.

Salvador Garcia  
Inspector

20/08/2012  
Date of Issue

Arar E. Gamillo  
Supervisor / Manager



| <b>MSA Altair 4</b> |                      |                   |                      |
|---------------------|----------------------|-------------------|----------------------|
| <b>Type</b>         | <b>Serial Number</b> | <b>Inspector</b>  | <b>Calibrated By</b> |
| MSA Appliances      | 102740               | Lenyn F Acosta    | A&M Industrial       |
| MSA Appliances      | 102561               | Javier Bafico     | A&M Industrial       |
| MSA Appliances      | 24732                | Ramachandra Bhat  | A&M Industrial       |
| MSA Appliances      | 150978               | Edgar Borgono     | A&M Industrial       |
| MSA Appliances      | 37295                | Wilson Bueno      | A&M Industrial       |
| MSA Appliances      | 19983                | Dave Campbell     | A&M Industrial       |
| MSA Appliances      | 20005                | John Cantelmi     | A&M Industrial       |
| MSA Appliances      | 102738               | Ernesto Cedro     | A&M Industrial       |
| MSA Appliances      | 19768                | Frank Cipriano    | A&M Industrial       |
| MSA Appliances      | 159950               | Kenneth Cheatham  | A&M Industrial       |
| MSA Appliances      | 55659                | Ian Cole          | A&M Industrial       |
| MSA Appliances      | 20010                | Carlos DeLuna     | A&M Industrial       |
| MSA Appliances      | 19992                | Mohamed Elmasry   | A&M Industrial       |
| MSA Appliances      | 22517                | Nelson Estrada    | A&M Industrial       |
| MSA Appliances      | 19979                | James Fabricatore | A&M Industrial       |
| MSA Appliances      | 102583               | Jose Ferreira     | A&M Industrial       |
| MSA Appliances      | 55626                | Hector Garcia     | A&M Industrial       |
| MSA Appliances      | 19994                | Sal Garcia        | A&M Industrial       |
| MSA Appliances      | 37344                | Pablo Gonzalez    | A&M Industrial       |
| MSA Appliances      | 19996                | Constancio Ira    | A&M Industrial       |
| MSA Appliances      | 117295               | Andrew Koncen     | A&M Industrial       |
| MSA Appliances      | 470620               | John Kraemer      | A&M Industrial       |
| MSA Appliances      | 34034                | Joshua Lane       | A&M Industrial       |
| MSA Appliances      | 55662                | Alvin Lewis       | A&M Industrial       |
| MSA Appliances      | 109406               | Edward Liabach    | A&M Industrial       |
| MSA Appliances      | 99728                | Robert McDougall  | A&M Industrial       |
| MSA Appliances      | 34032                | Mikhail Medvedev  | A&M Industrial       |
| MSA Appliances      | 109549               | Philip Mellijor   | A&M Industrial       |
| MSA Appliances      | 109340               | David Mendoza     | A&M Industrial       |
| MSA Appliances      | 159925               | Peter Ouellette   | A&M Industrial       |
| MSA Appliances      | 99726                | Paul Papa         | A&M Industrial       |
| MSA Appliances      | 109402               | Rich Pellegrini   | A&M Industrial       |
| MSA Appliances      | 19980                | Louis Petrone     | A&M Industrial       |
| MSA Appliances      | 123519               | Danny Reis        | A&M Industrial       |
| MSA Appliances      | 99054                | Joe Rubenstein    | A&M Industrial       |
| MSA Appliances      | 99044                | John Sanchez      | A&M Industrial       |
| MSA Appliances      | 19984                | Roger Soares      | A&M Industrial       |
| MSA Appliances      | 19986                | Marcelo Sosa      | A&M Industrial       |
| MSA Appliances      | 19990                | Sergio Sosa       | A&M Industrial       |
| MSA Appliances      | 45632                | Glenn Temple      | A&M Industrial       |
| MSA Appliances      | 01613                | Luis Uribe        | A&M Industrial       |
| MSA Appliances      | 20002                | Mehmet Uygun      | A&M Industrial       |



**WOODBACK INVENTORY**

| <u>Serial Number</u> | <u>Date Certified</u> | <u>Inspector</u>  | <u>Next Calibration Date</u> |
|----------------------|-----------------------|-------------------|------------------------------|
| 632499               | 10/05/2012            | Lenyn Acosta      | 10/05/2013                   |
| 673462               | 26/10/2012            | Javier Bafico     | 26/10/2013                   |
| 599773               | 9/03/2012             | Ramachandra Bhat  | 9/03/2013                    |
| 632880               | 6/03/2012             | Edgar Borgono     | 6/03/2013                    |
| 666885               | 18/04/2012            | Wilson Bueno      | 18/04/2013                   |
| 348486               | 22/02/2012            | Dave Campbell     | 22/02/2013                   |
| 618029               | 21/02/2012            | John Cantelmi     | 21/02/2013                   |
| 666873               | 24/04/2012            | Ernesto Cedro     | 24/04/2013                   |
| 673491               | 9/10/2012             | Kenneth Cheatham  | 9/10/2013                    |
| 666876               | 20/02/2012            | Ian Cole          | 20/02/2013                   |
| 523769               | 25/04/2012            | Carlos DeLuna     | 25/04/2013                   |
| 640378               | 11/04/2012            | Mohamed Elmasry   | 11/04/2013                   |
| 468061               | 29/06/2012            | Nelson Estrada    | 29/06/2013                   |
| 617988               | 16/03/2012            | James Fabricatore | 16/03/2013                   |
| 695473               | 10/07/2012            | Jose Ferreira     | 10/07/2013                   |
| 632902               | 20/03/2012            | Hector Garcia     | 20/03/2013                   |
| 569279               | 15/03/2012            | Sal Garcia        | 15/03/2013                   |
| 632956               | 18/06/2012            | Pablo Gonzalez    | 18/06/2013                   |
| 647880               | 15/10/2012            | Constancio Ira    | 15/10/2013                   |
| 666719               | 9/04/2012             | Andrew Koncen     | 9/04/2013                    |
| 716404               | 2/11/2012             | John Kraemer      | 2/11/2013                    |
| 673527               | 15/08/2012            | Joshua Lane       | 15/08/2013                   |
| 617948               | 14/02/2012            | Alvin Lewis       | 14/02/2013                   |
| 640216               | 28/02/2012            | Edward Liabach    | 28/02/2013                   |
| 632475               | 7/03/2012             | Robert McDougall  | 7/03/2013                    |
| 695430               | 27/02/2012            | Mikhail Medvedev  | 27/02/2013                   |
| 695459               | 29/05/2012            | Philip Mellijor   | 29/05/2013                   |
| 640284               | 11/04/2012            | David Mendoza     | 11/04/2013                   |
| 640268               | 7/03/2012             | Peter Ouellette   | 7/03/2013                    |
| <b>673524</b>        | <b>5/10/2011</b>      | <b>Paul Papa</b>  | <b>5/10/2012</b>             |
| 598177               | 2/03/2012             | Rich Pellegrini   | 2/03/2013                    |
| 599808               | 21/03/2012            | Louis Petrone     | 21/03/2013                   |
| 695431               | 29/06/2012            | Danny Reis        | 29/06/2013                   |
| 632996               | 15/03/2012            | Joe Rubenstein    | 15/03/2013                   |
| 695468               | 17/07/2012            | John Sanchez      | 17/07/2013                   |
| 598073               | 8/02/2012             | Roger Soares      | 8/02/2013                    |
| 632934               | 29/05/2012            | Marcelo Sosa      | 29/05/2013                   |
| 653112               | 5/03/2012             | Sergio Sosa       | 5/03/2013                    |
| 716572               | 26/10/2012            | Glenn Temple      | 26/10/2013                   |
| 598076               | 25/09/2012            | Luis Uribe        | 25/09/2013                   |
| 653171               | 8/03/2012             | Mehmet Uygun      | 8/03/2013                    |



| THERMOPROBE INVENTORY |               |                |                   |                       |                |
|-----------------------|---------------|----------------|-------------------|-----------------------|----------------|
| Type                  | Serial Number | Date Certified | Inspector         | Next Calibration Date | Calibrated By  |
| Thermoprobe           | TP5C-1605     | 13/03/2012     | Lenyn Acosta      | 13/03/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0478     | 21/08/2012     | Javier Bafico     | 21/08/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0503     | 17/08/2012     | Ramachandra Bhat  | 17/08/2013            | Petro Marine   |
| Thermoprobe           | TP5C-1872     | 6/03/2012      | Ramachandra Bhat  | 6/03/2013             | Petro Marine   |
| Thermoprobe           | TP2C-0595     | 27/02/2012     | Edgar Borgono     | 27/02/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0611     | 30/04/2012     | Wilson Bueno      | 30/04/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0608     | 17/05/2012     | Dave Campbell     | 17/05/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0593     | 20/07/2012     | John Canteimi     | 20/07/2013            | Petro Marine   |
| Isotherm Mark II      | 1F123265      | 10/07/2012     | Ernesto Cedro     | 10/07/2013            | W.L Walker Co. |
| Isotherm Mark II      | 1A102722      | 28/06/2012     | Kenneth Cheatham  | 28/06/2013            | W.L Walker Co. |
| Thermoprobe           | TP5C-2746     | 25/07/2012     | Ian Cole          | 25/07/2013            | ThermoProbe    |
| Isotherm Mark II      | 1F123263      | 10/07/2012     | Carlos Deluna     | 10/07/2013            | W.L Walker Co. |
| Thermoprobe           | TP2C-0433     | 3/02/2012      | Mohamed Elmasry   | 3/02/2013             | Petro Marine   |
| Thermoprobe           | TP2C-0617     | 22/05/2012     | Nelson Estrada    | 22/05/2013            | Petro Marine   |
| Thermoprobe           | TP5C-1409     | 14/11/2011     | James Fabricatore | 14/11/2012            | Petro Marine   |
| Thermoprobe           | TP5C-0329     | 21/06/2012     | Jose Ferreira     | 21/06/2013            | Petro Marine   |
| Isotherm Mark II      | 1F123264      | 10/07/2012     | Hector Garcia     | 10/07/2013            | W.L Walker Co. |
| Isotherm Mark II      | 1C041396      | 9/05/2012      | Sal Garcia        | 9/05/2013             | W.L Walker Co. |
| Isotherm Mark II      | 1A102713      | 17/05/2012     | Pablo Gonzalez    | 17/05/2013            | W.L Walker Co. |
| Thermoprobe           | TP5C-1501     | 27/06/2012     | Constancio Ira    | 27/06/2013            | Petro Marine   |
| Thermoprobe           | TP5C-0335     | 22/05/2012     | Andrew Koncen     | 22/05/2013            | Petro Marine   |
| Thermoprobe           | TP5C-1252     | 21/09/2012     | John Kraemer      | 21/09/2013            | Petro Marine   |
| Thermoprobe           | TP5C-1603     | 10/02/2012     | Joshua Lane       | 10/02/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0616     | 2/05/2012      | Alvin Lewis       | 2/05/2013             | Petro Marine   |
| Thermoprobe           | TP2C-0591     | 13/03/2012     | Edward Liabach    | 13/03/2013            | Petro Marine   |
| Thermoprobe           | TP5C-0922     | 7/06/2012      | Robert McDougall  | 7/06/2013             | Petro Marine   |
| Thermoprobe           | TP2C-0598     | 31/05/2012     | Mikhail Medvedev  | 31/05/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0670     | 13/06/2012     | Philip Mellijor   | 13/06/2013            | Petro Marine   |
| Isotherm Mark II      | 1H 09 2629    | 1/10/2012      | David Mendoza     | 1/10/2013             | W.L Walker Co. |
| Isotherm Mark II      | 1A051553      | 24/07/2012     | Peter Ouellette   | 24/07/2013            | W.L Walker Co. |
| Thermoprobe           | TP2C-0665     | 13/02/2012     | Paul Papa         | 13/02/2013            | Petro Marine   |
| Isotherm Mark II      | 1I082461      | 22/03/2012     | Rich Pellegrini   | 22/03/2013            | W.L Walker Co. |
| Isotherm Mark II      | 1E112972      | 15/10/2012     | Louis Petrone     | 15/10/2013            | W.L Walker Co. |
| Thermoprobe           | TP2C-0597     | 7/06/2012      | Danny Reis        | 7/06/2013             | Petro Marine   |
| Isotherm Mark II      | 1A061911      | 28/06/2012     | Joe Rubenstein    | 28/06/2013            | W.L Walker Co. |
| Thermoprobe           | TP5C-0472     | 30/04/2012     | John Sanchez      | 30/04/2013            | Petro Marine   |
| Isotherm Mark II      | 1E031270      | 7/06/2012      | Roger Soares      | 7/06/2013             | W.L Walker Co. |
| Thermoprobe           | TP2C-0612     | 13/04/2012     | Marcelo Sosa      | 13/04/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0359     | 11/07/2012     | Sergio Sosa       | 11/07/2013            | Petro Marine   |
| Isotherm Mark II      | 1C092550      | 16/10/2012     | Glenn Temple      | 16/10/2013            | W.L Walker Co. |
| Thermoprobe           | TP2C-0667     | 10/07/2012     | Luis Uribe        | 10/07/2013            | Petro Marine   |
| Thermoprobe           | TP2C-0666     | 20/07/2012     | Mehmet Uygun      | 20/07/2013            | Petro Marine   |
| Thermoprobe           | TP5C-2360     | 8/11/2011      | Asphalt Probe     | 8/11/2012             | Petro Marine   |
| Thermoprobe           | TP8-3269      | 22/03/2012     | Asphalt Probe     | 22/03/2013            | Petro Marine   |



**NIST THERMOMETER INVENTORY**

| <b>Serial Number</b> | <b>Date Certified</b> | <b>Inspector</b>  | <b>Exp. Date</b> | <b>Calibrated By</b> |
|----------------------|-----------------------|-------------------|------------------|----------------------|
| 666793               | 4/05/2011             | Lenyn Acosta      | 4/05/2016        | Kessler              |
| 639660               | 4/05/2011             | Javier Bafico     | 4/05/2016        | Kessler              |
| 598301               | 22/04/2008            | Ramachandra Bhat  | 22/04/2013       | Kessler              |
| 666785               | 4/05/2011             | Edgar Borgono     | 4/05/2016        | Kessler              |
| 653076               | 2/08/2010             | Wilson Bueno      | 2/08/2015        | Kessler              |
| 666781               | 4/05/2011             | Dave Campbell     | 4/05/2016        | Kessler              |
| 666866               | 4/05/2011             | John Cantelmi     | 4/05/2016        | Kessler              |
| 666677               | 18/04/2011            | Ernesto Cedro     | 18/04/2016       | Kessler              |
| 687615               | 20/06/2012            | Kenneth Cheatham  | 20/07/2017       | Kessler              |
| 687842               | 19/09/2011            | Ian Cole          | 19/09/2016       | Kessler              |
| 599903               | 22/04/2008            | Carlos DeLuna     | 22/04/2013       | Kessler              |
| 687647               | 19/09/2011            | Mohamed Elmasry   | 19/09/2016       | Kessler              |
| 666723               | 20/06/2012            | Nelson Estrada    | 20/07/2017       | Kessler              |
| 648695               | 20/05/2010            | James Fabricatore | 20/05/2015       | Kessler              |
| 687620               | 20/06/2012            | Jose Ferreira     | 20/07/2017       | Kessler              |
| 653095               | 2/08/2010             | Hector Garcia     | 2/09/2015        | Kessler              |
| 617893               | 19/01/2011            | Sal Garcia        | 19/01/2016       | Kessler              |
| 687919               | 8/09/2011             | Pablo Gonzalez    | 8/09/2016        | Kessler              |
| 687668               | 19/09/2011            | Constancio Ira    | 19/09/2016       | Kessler              |
| 598328               | 15/04/2008            | Andrew Koncen     | 12/04/2013       | Kessler              |
| 687706               | 20/06/2012            | John Kraemer      | 20/07/2017       | Kessler              |
| 648594               | 20/05/2010            | Joshua Lane       | 20/05/2015       | Kessler              |
| 6487267              | 20/05/2010            | Alvin Lewis       | 20/05/2015       | Kessler              |
| 599782               | 22/04/2008            | Edward Liabach    | 22/04/2013       | Kessler              |
| 687887               | 8/09/2011             | Robert McDougall  | 8/09/2016        | Kessler              |
| 687633               | 19/09/2011            | Mikhail Medvedev  | 19/09/2016       | Kessler              |
| 687814               | 8/09/2011             | Philip Mellijor   | 8/09/2016        | Kessler              |
| 617922               | 19/01/2011            | David Mendoza     | 19/01/2016       | Kessler              |
| 687807               | 19/09/2011            | Peter Ouellette   | 19/09/2016       | Kessler              |
| 648705               | 18/04/2011            | Paul Papa         | 18/04/2016       | Kessler              |
| 688021               | 19/09/2011            | Rich Pellegrinni  | 19/09/2016       | Kessler              |
| 653181               | 30/08/2010            | Louis Petrone     | 30/08/2015       | Kessler              |
| 688026               | 8/09/2011             | Danny Reis        | 8/09/2016        | Kessler              |
| 666896               | 4/05/2011             | Joe Rubenstein    | 4/05/2016        | Kessler              |
| 666807               | 20/06/2012            | John Sanchez      | 20/07/2017       | Kessler              |
| 599850               | 22/04/2008            | Roger Soares      | 22/04/2013       | Kessler              |
| 648683               | 20/05/2010            | Marcelo Sosa      | 20/05/2015       | Kessler              |
| 662019               | 17/01/2010            | Sergio Sosa       | 17/11/2015       | Kessler              |
| 687658               | 20/06/2012            | Glenn Temple      | 20/07/2017       | Kessler              |
| 666882               | 4/05/2011             | Luis Uribe        | 4/05/2016        | Kessler              |
| 653255               | 2/08/2010             | Mehmet Uygun      | 2/09/2015        | Kessler              |



| TAPE INVENTORY LIST |               |                |                   |                       |               |
|---------------------|---------------|----------------|-------------------|-----------------------|---------------|
| Type                | Serial Number | Date Certified | Inspector         | Next Calibration Date | Calibrated By |
| Lufkin 75' Innage   | PM-1033       | 17/07/2012     | Leryn Acosta      | 17/07/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0912       | 5/05/2012      | Leryn Acosta      | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-1030       | 17/07/2012     | Javier Bafico     | 17/07/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0966       | 5/05/2012      | Javier Bafico     | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-0902       | 10/02/2012     | Ramachandra Bhat  | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0584       | 18/05/2012     | Ramachandra Bhat  | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0981       | 17/05/2012     | Edgar Borgono     | 17/05/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0969       | 5/05/2012      | Edgar Borgono     | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-0893       | 10/02/2012     | Wilson Bueno      | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0971       | 5/05/2012      | Wilson Bueno      | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-1086       | 3/10/2012      | Dave Campbell     | 3/10/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0605       | 18/05/2012     | Dave Campbell     | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0889       | 10/02/2012     | John Cantelmi     | 10/02/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0602       | 18/05/2012     | John Cantelmi     | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1087       | 3/10/2012      | Ernesto Cedro     | 3/10/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0601       | 18/05/2012     | Ernesto Cedro     | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1061       | 14/08/2012     | Kenneth Cheatham  | 14/08/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0350       | 18/05/2012     | Kenneth Cheatham  | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0980       | 17/05/2012     | Ian Cole          | 17/05/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0579       | 18/05/2012     | Ian Cole          | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0897       | 10/02/2012     | Carlos Deluna     | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0593       | 18/05/2012     | Carlos Deluna     | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1060       | 14/08/2012     | Mohamed Elmasry   | 14/08/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0970       | 5/05/2012      | Mohamed Elmasry   | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-1021       | 12/06/2012     | Nelson Estrada    | 12/06/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0985       | 17/05/2012     | Nelson Estrada    | 17/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0892       | 10/02/2012     | James Fabricatore | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0650       | 18/05/2012     | James Fabricatore | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1022       | 12/06/2012     | Jose Ferreira     | 12/06/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0578       | 26/06/2012     | Jose Ferreira     | 26/06/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1057       | 14/08/2012     | Hector Garcia     | 14/08/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0972       | 5/05/2012      | Hector Garcia     | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-0883       | 10/02/2012     | Sal Garcia        | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0965       | 5/05/2012      | Sal Garcia        | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-0982       | 17/05/2012     | Pablo Gonzalez    | 17/05/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0983       | 17/05/2012     | Pablo Gonzalez    | 17/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0899       | 10/02/2012     | Constancio Ira    | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0934       | 5/05/2012      | Constancio Ira    | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-0891       | 10/02/2012     | Andrew Koncen     | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0581       | 18/05/2012     | Andrew Koncen     | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1089       | 3/10/2012      | John Kraemer      | 3/10/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0330       | 26/06/2012     | John Kraemer      | 26/06/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0885       | 10/02/2012     | Joshua Lane       | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0353       | 26/06/2012     | Joshua Lane       | 26/06/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0895       | 10/02/2012     | Alvin Lewis       | 10/02/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0642       | 18/05/2012     | Alvin Lewis       | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0896       | 10/02/2012     | Edward Liabach    | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0600       | 18/05/2012     | Edward Liabach    | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0900       | 10/02/2012     | Robert McDougall  | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0587       | 18/05/2012     | Robert McDougall  | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0844       | 30/11/2011     | Mikhail Medvedev  | 29/11/2012            | Petro Marine  |
| Lufkin 75' Outage   | PM-0913       | 5/05/2012      | Mikhail Medvedev  | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-0906       | 10/02/2012     | Philip Mellijor   | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0973       | 5/05/2012      | Philip Mellijor   | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-0887       | 10/02/2012     | David Mendoza     | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0588       | 18/05/2012     | David Mendoza     | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0846       | 30/11/2011     | Peter Ouellette   | 29/11/2012            | Petro Marine  |
| Lufkin 75' Outage   | PM-0357       | 26/06/2012     | Peter Ouellette   | 26/06/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0898       | 10/02/2012     | Paul Papa         | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0603       | 18/05/2012     | Paul Papa         | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1023       | 12/06/2012     | Rich Pellegrini   | 12/06/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0607       | 18/05/2012     | Rich Pellegrini   | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0845       | 30/11/2011     | Louis Petrone     | 29/11/2012            | Petro Marine  |
| Lufkin 75' Outage   | PM-0580       | 18/05/2012     | Louis Petrone     | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1020       | 12/06/2012     | Danny Reis        | 12/06/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0984       | 17/05/2012     | Danny Reis        | 17/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1032       | 17/07/2012     | Joe Rubenstein    | 17/07/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0604       | 18/05/2012     | Joe Rubenstein    | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0884       | 10/02/2012     | John Sanchez      | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0595       | 18/05/2012     | John Sanchez      | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0894       | 10/02/2012     | Roger Soares      | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0608       | 18/05/2012     | Roger Soares      | 18/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0979       | 17/05/2012     | Marcelo Sosa      | 17/05/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0985       | 17/05/2012     | Marcelo Sosa      | 17/05/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0901       | 10/02/2012     | Sergio Sosa       | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0787       | 26/06/2012     | Sergio Sosa       | 26/06/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-1088       | 3/10/2012      | Glenn Temple      | 3/10/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0908       | 26/06/2012     | Glenn Temple      | 26/06/2013            | Petro Marine  |
| Lufkin 75' Innage   | PM-0903       | 10/02/2012     | Luis Uribe        | 9/02/2013             | Petro Marine  |
| Lufkin 75' Outage   | PM-0967       | 5/05/2012      | Luis Uribe        | 5/05/2013             | Petro Marine  |
| Lufkin 75' Innage   | PM-1058       | 14/08/2012     | Mehmet Uygun      | 14/08/2013            | Petro Marine  |
| Lufkin 75' Outage   | PM-0576       | 18/05/2012     | Mehmet Uygun      | 18/05/2013            | Petro Marine  |



| HERMETIC UTI INVENTORY       |               |                |                       |                     |          |
|------------------------------|---------------|----------------|-----------------------|---------------------|----------|
| Description                  | Serial Number | Date Certified | Next Calibration Date | Calibrated By       | Comments |
| Hermetic UTI Meter Gtex Tape | G-11499       | 10/04/2012     | 10/04/2013            | Honeywell Hermetics |          |
| Hermetic UTI Meter Gtex Tape | G-11500       | 10/04/2012     | 10/04/2013            | Honeywell Hermetics |          |
| Hermetic UTI Meter Gtex Tape | G-13362       | 23/01/2012     | 23/01/2013            | Honeywell Hermetics |          |
| Hermetic UTI Meter Gtex Tape | G-15297       | 23/04/2012     | 23/04/2013            | Honeywell Hermetics |          |
| Hermetic UTI Meter Gtex Tape | G-16266       | 1/02/2012      | 1/02/2013             | Honeywell Hermetics |          |
| Hermetic Sampler             | AC-534        |                |                       | Honeywell Hermetics |          |
| Hermetic Sampler             | AC-670        |                |                       | Honeywell Hermetics |          |
| Hermetic Sampler             | AV-197        |                |                       | Honeywell Hermetics |          |
| Hermetic Sampler             | AV-634        |                |                       | Honeywell Hermetics |          |
| Hermetic Sampler             | AV-702        |                |                       | Honeywell Hermetics |          |
| Hermetic Sampler             | SX-1021       |                |                       | Honeywell Hermetics |          |
| Hermetic Methanol Sampler    | AC-741        |                |                       | Honeywell Hermetics |          |
|                              |               |                |                       |                     |          |

| MMC INVENTORY             |               |                |                       |                   |          |
|---------------------------|---------------|----------------|-----------------------|-------------------|----------|
| Description               | Serial Number | Date Certified | Next Calibration Date | Calibrated By     | Comments |
| MMC Restricted 30 M/ C*   | 20029         | 10/01/2012     | 10/01/2013            | MMC International |          |
| MMC Restricted 100 Ft/ F* | 22390         | 29/03/2012     | 29/03/2013            | MMC International |          |
| MMC Restricted 100 Ft/ F* | 5509          | 26/07/2012     | 26/07/2013            | MMC International |          |
| MMC Restricted 100 Ft/ F* | 6119          | 30/01/2012     | 30/01/2013            | MMC International |          |
| MMC Restricted 100 Ft/ F* | 6270          | 25/04/2012     | 25/04/2013            | MMC International |          |
| MMC Sampler               | SD-5596       |                |                       | MMC International |          |
| MMC Sampler               | SD-5673       |                |                       | MMC International |          |
| MMC Sampler               | SD-5776       |                |                       | MMC International |          |
| MMC Sampler               | SD-5777       |                |                       | MMC International |          |
| MMC Closed Sampler        | SC-2826       |                |                       | MMC International |          |
|                           |               |                |                       |                   |          |







GAUGE TAPE INVENTORY & CALIBRATION LOG

LOCATION: Linden, New Jersey Year: 2012

| TAPE DESCRIPTION                    | TAPE No | SERIAL No | MASTER TAPE No |        | WORKING TAPE ACCURACY |                   | MASTER TAPE ACCURACY |                   | WORKING TAPE ACCURACY |             | CALIBRATED BY | DATE | Out of Service Date |
|-------------------------------------|---------|-----------|----------------|--------|-----------------------|-------------------|----------------------|-------------------|-----------------------|-------------|---------------|------|---------------------|
|                                     |         |           | FT - INS       | M - CM | FT - IN or M - CM     | FT - IN or M - CM | FT - IN or M - CM    | FT - IN or M - CM |                       |             |               |      |                     |
| 30M UT Meter Class Tape S/N G11499  | 1013    | RB2016    | 18069          | 10099M | +/- 1.10 in           | +/- 1.10 in       | +/- 2mm              | +/- 2mm           | Worcester North etc   | 10-Apr-2012 | 16-Apr-2013   |      |                     |
| 100P UT Meter Class Tape S/N G11500 | 298     | RB2017    | 18069          | 10099M | +/- 1.10 in           | +/- 1.10 in       | +/- 2mm              | +/- 2mm           | Worcester North etc   | 10-Apr-2012 | 16-Apr-2013   |      |                     |
| 23M UT Meter Class Tape S/N G13362  | 498     | RB2109    | 18069          | 10099M | +/- 1.10 in           | +/- 1.10 in       | +/- 2mm              | +/- 2mm           | Worcester North etc   | 23-Ene-2012 | 22-Ene-2013   |      |                     |
| 30M UT Meter Class Tape S/N G15297  | 135     | RC0419    | 18069          | 10099M | +/- 1.10 in           | +/- 1.10 in       | +/- 2mm              | +/- 2mm           | Worcester North etc   | 23-Apr-2012 | 23-Apr-2013   |      |                     |
| 30M UT Meter Class Tape S/N G16200  | 770     | RD0009    | 18069          | 10099M | +/- 1.10 in           | +/- 1.10 in       | +/- 2mm              | +/- 2mm           | Worcester North etc   | 01-Feb-2012 | 31-Ene-2013   |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |
|                                     |         |           |                |        |                       |                   |                      |                   |                       |             |               |      |                     |

1) All working tapes must be checked for accuracy before initial use.  
 2) Out of Service Date will automatically fill in - do not type in this section.



GAUGE TAPE INVENTORY & CALIBRATION LOG

LOCATION: Linden, New Jersey Year: 2012

| TAPE DESCRIPTION            | TAPE No | MODEL No | MASTER TAPE No |        | WORKING TAPE ACCURACY  |                        | MASTER TAPE ACCURACY   |                        | WORKING TAPE ACCURACY |             | CALIBRATED BY | DATE | Out of Service Date |
|-----------------------------|---------|----------|----------------|--------|------------------------|------------------------|------------------------|------------------------|-----------------------|-------------|---------------|------|---------------------|
|                             |         |          | FT - INS       | M - CM | FT - IN or M - CM      | FT - IN or M - CM      | FT - IN or M - CM      | FT - IN or M - CM      |                       |             |               |      |                     |
| 30M MMC Tenside Restricted  | 20020   | D-2401-2 | Unknown        |        | +/- 1/8 inch (+/- 3mm) | MMC Int Corp.         | 03-Ene-2012 | 02-Ene-2013   |      |                     |
| 100P MMC Tenside Restricted | 22390   | D-2401-2 | Unknown        |        | +/- 1/8 inch (+/- 3mm) | MMC Int Corp.         | 28-Mar-2012 | 28-Mar-2013   |      |                     |
| 100P MMC Tenside Restricted | 9509    | D-2401-2 | Unknown        |        | +/- 1/8 inch (+/- 3mm) | MMC Int Corp.         | 23-Jul-2012 | 23-Jul-2013   |      |                     |
| 100P MMC Tenside Restricted | 6118    | D-2401-2 | Unknown        |        | +/- 1/8 inch (+/- 3mm) | MMC Int Corp.         | 25-Ene-2012 | 24-Ene-2013   |      |                     |
| 100P MMC Tenside Restricted | 22473   | D-2401-2 | Unknown        |        | +/- 1/8 inch (+/- 3mm) | MMC Int Corp.         | 24-Apr-2012 | 24-Apr-2013   |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |
|                             |         |          |                |        |                        |                        |                        |                        |                       |             |               |      |                     |

1) All working tapes must be checked for accuracy before initial use.  
 2) Out of Service Date will automatically fill in - do not type in this section.



**HERMETIC UTI  
ANNUAL TEMPERATURE UNIT VERIFICATION  
AT THREE TEMPERATURES**

LOCATION: Linden, New Jersey YEAR: 2012

| DATE     | Model Type             | Unit Number | NIST            |                    |                 | TEMPERATURE |       |       | VARIANCE |     |     | CALIBRATED BY            |
|----------|------------------------|-------------|-----------------|--------------------|-----------------|-------------|-------|-------|----------|-----|-----|--------------------------|
|          |                        |             | Thermometer No. | Thermometer No.    | Thermometer No. | HIGH        | MID   | LOW   | HIGH     | MID | LOW |                          |
| 04/16/12 | Hermetic U/Tmeter Glas | G-11499     | Cole-Parmer     | Kessler S/N 816374 | Naslab          | 80.0C       | 15.0C | 0.0C  | *        | *   | 0   | Honeywell Hermetic, Inc. |
| 04/16/12 | Hermetic U/Tmeter Glas | G-11500     | Cole-Parmer     | Kessler S/N 816374 | Naslab          | 142.0F      | 59.0F | 32.0F | *        | *   | 0   | Honeywell Hermetic, Inc. |
| 01/27/12 | Hermetic U/Tmeter Glas | G-13362     | Cole-Parmer     | Kessler S/N 816374 | Naslab          | 80.0C       | 15.0C | 0.0C  | *        | *   | 0   | Honeywell Hermetic, Inc. |
| 04/27/12 | Hermetic U/Tmeter Glas | G-15287     | Cole-Parmer     | Kessler S/N 816374 | Naslab          | 140.0F      | 59.0F | 32.0F | *        | *   | 0   | Honeywell Hermetic, Inc. |
| 02/06/12 | Hermetic U/Tmeter Glas | G-16266     | Cole-Parmer     | Kessler S/N 816374 | Naslab          | 80.0C       | 15.0C | 0.0C  | *        | *   | 0   | Honeywell Hermetic, Inc. |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |
|          |                        |             |                 |                    |                 |             |       |       |          |     |     |                          |

1) All Portable Electronic Thermometers must be calibrated once per Year at three temperatures.



**MMC UNIT  
ANNUAL TEMPERATURE UNIT VERIFICATION  
AT THREE TEMPERATURES**

LOCATION: Linden, New Jersey YEAR: 2012

| DATE     | Model Type           | Unit Number | NIST            |                 |                 | TEMPERATURE |       |      | VARIANCE |     |     | CALIBRATED BY           |
|----------|----------------------|-------------|-----------------|-----------------|-----------------|-------------|-------|------|----------|-----|-----|-------------------------|
|          |                      |             | Thermometer No. | Thermometer No. | Thermometer No. | HIGH        | MID   | LOW  | HIGH     | MID | LOW |                         |
| 01/16/12 | MMC Restricted 30M   | 20029       | 880242          | 829708          | 122-402         | 190.4       | 111.4 | 32.2 | 0        | -2  | -1  | MMC International Corp. |
| 07/30/12 | MMC Restricted 100Ft | 5509        | 880242          | 820729          | 107-600         | 190.4       | 104.4 | 31.8 | +2       | -2  | 0   | MMC International Corp. |
| 02/02/12 | MMC Restricted 100Ft | 8119        | 880242          | 820729          | 107-600         | 190.4       | 104.1 | 32.2 | 0        | 0   | 0   | MMC International Corp. |
| 03/30/12 | MMC Restricted 100Ft | 22329       | 880242          | 820729          | 107-600         | 190.0       | 104.0 | 32.2 | 0        | -3  | 0   | MMC International Corp. |
| 04/27/12 | MMC Restricted 100Ft | 8270        | 880242          | 820729          | 107-600         | 190.4       | 104.0 | 32.2 | -1       | -2  | +1  | MMC International Corp. |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |
|          |                      |             |                 |                 |                 |             |       |      |          |     |     |                         |

1) All Portable Electronic Thermometers must be calibrated once per Year at three temperatures.



**WOODBACK ANNUAL CHECK**

**DATE:** 15/03/2012

**WOODBACK S/N:** 569279

**MASTER HIGH THERM # 1 S/N** 647855

**MASTER AMBIENT THERM # 2 S/N** 569300

**MASTER COLD THERM # 3 S/N** 647856

**INSPECTOR'S NAME:** Salvador Garcia

|                       | <b><u>MASTER TEMPERATURE</u></b> | <b><u>WOODBACK TEMPERATURE</u></b> |
|-----------------------|----------------------------------|------------------------------------|
| <b><u>HOT</u></b>     | <u>144.0</u>                     | <u>144.0</u>                       |
| <b><u>AMBIENT</u></b> | <u>75.0</u>                      | <u>75.0</u>                        |
| <b><u>COLD</u></b>    | <u>32.2</u>                      | <u>32.0</u>                        |

*API MPMS 8.3 Glass and Mercury in Glass Thermometer Verification*  
*API MPMS 8.3.1 Bench Inspection: Before each thermometer's initial use, each thermometer shall be compared against a NIST certified thermometer.*

*The comparison shall be made at three or more temperatures to ensure that the thermometer is accurate within the limits giving in table 8. Typically the check points should be at 10%, 50% and 90% of the temperature range in which the thermometer is expected to be used.*

**Supervisor Signature:** Sandra L. Lucca  
Sandra L. Lucca  
Health, Safety & Calibration Mgr

# AmSpec FIELD EQUIPMENT MONTHLY CHECK

INSPECTOR'S NAME: Asphalt Probe DATE: 3/08/2012  
 MASTER HIGH THERM SN#: 647855  
 MASTER LOW THERM SN#: 647856  
 H2S STATION \_\_\_\_\_  
 P.E.T. SERIAL #: TP5C-2360  
 FIELD NIST SERIAL # \_\_\_\_\_  
 ALTAIR SERIAL # \_\_\_\_\_

**ENTERED ONTO:**  
 INSCAL-02 **YES** **NO**  
 INSCAL-04 **YES** **NO**  
 BY: Joan L. Carrillo  
 DATE: 3/08/2012

|                  |                           |                               |
|------------------|---------------------------|-------------------------------|
|                  | <u>MASTER TEMPERATURE</u> | <u>P.E.T. TEMPERATURE</u>     |
| HIGH TEMPERATURE | <u>140.4</u>              | <u>140.3</u>                  |
| LOW TEMPERATURE  | <u>32.2</u>               | <u>32.3</u>                   |
|                  | <u>MASTER TEMPERATURE</u> | <u>FIELD NIST TEMPERATURE</u> |
| HIGH TEMPERATURE | _____                     | _____                         |
| LOW TEMPERATURE  | _____                     | _____                         |

**API MPMS 8.2.2 Monthly verification and inspection:**

On a monthly basis, the Portable Electronic Thermometer (PET) MUST be checked at two temperatures near the ends of its range against a NIST-certified Thermometer. Do this by placing the PET & Thermometer side-by-side in a circulating bath and leaving them undisturbed for a minimum of 10 minutes before making the comparative reading within a 0.2°F tolerance.

ALTAIR "BUMP TEST" **PASS** **FAIL**

The unit's alarm MUST sound at 10ppm. If it does not sound at 10ppm and higher this is a "FAIL". If it does sound, it is a "PASS". If the appropriate value is not displayed or alarm activated at 10ppm, the unit MUST be removed from service until repairs and/or recalibration is performed. Employees are NOT to perform service of any kind on the Altair units.

## SUPERVISOR VISUAL INSPECTION CHECK

SUPERVISOR'S NAME: Joan L. Carrillo DATE: 3/08/2012

PROBE GROUNDING CABLE ATTACHED: **YES** **NO**  
 INNAGE GAUGE TAPE GROUND ATTACHED: **YES** **NO** TAPE SN: \_\_\_\_\_ BOB SN: \_\_\_\_\_  
 ULLAGE GAUGE TAPE GROUND ATTACHED: **YES** **NO** TAPE SN: \_\_\_\_\_ BOB SN: \_\_\_\_\_

ANY PET or Gauge Tape that is missing a Ground Cable is to be removed form service immediately until repairs can be made.

This form is to be completed by EVERY member of the Field Staff on a monthly basis and submitted to their respective supervisor for visual confirmation. The information MUST then be transferred to the appropriate INSCAL forms for proper documentation and review. This information must be retained for 5 years and is an auditable item.





**HERMETIC UTI  
MONTHLY TEMPERATURE UNIT VERIFICATION  
AT TWO TEMPERATURES**

LOCATION: Linden, New Jersey

YEAR: 2012

| DATE           | Model Type             | Unit Number | HIGH Nist<br>Thermometer No. | LOW Nist<br>Thermometer No. | TEMPERATURE |      | VARIANCE |     | CALBRATED BY     |
|----------------|------------------------|-------------|------------------------------|-----------------------------|-------------|------|----------|-----|------------------|
|                |                        |             |                              |                             | HIGH        | LOW  | HIGH     | LOW |                  |
| <b>*April*</b> |                        |             |                              |                             |             |      |          |     |                  |
| 04/16/12       | Hermetic UTimeter Glex | G-11499     | 647855                       | 647856                      | 142.8       | 32.4 | -3       | +1  | Juan L. Carrillo |
| 04/16/12       | Hermetic UTimeter Glex | G-11500     | 647855                       | 647856                      | 142.2       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 04/20/12       | Hermetic UTimeter Glex | G-13362     | 647855                       | 647856                      | 143.6       | 32.4 | -2       | -1  | Juan L. Carrillo |
| 04/16/12       | Hermetic UTimeter Glex | G-15297     | 647855                       | 647856                      | 142.6       | 32.2 | +2       | +2  | Juan L. Carrillo |
| 04/16/12       | Hermetic UTimeter Glex | G-16266     | 647855                       | 647856                      | 142.8       | 32.2 | +2       | -1  | Juan L. Carrillo |
| <b>*May*</b>   |                        |             |                              |                             |             |      |          |     |                  |
| 05/16/12       | Hermetic UTimeter Glex | G-11499     | 647855                       | 647856                      | 139.8       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 05/16/12       | Hermetic UTimeter Glex | G-11500     | 647855                       | 647856                      | 139.0       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 05/29/12       | Hermetic UTimeter Glex | G-13362     | 647855                       | 647856                      | 144.4       | 32.2 | -2       | -1  | Juan L. Carrillo |
| 05/16/12       | Hermetic UTimeter Glex | G-15297     | 647855                       | 647856                      | 140.0       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 05/17/12       | Hermetic UTimeter Glex | G-16266     | 647855                       | 647856                      | 139.8       | 32.2 | -2       | +2  | Juan L. Carrillo |
| <b>*June*</b>  |                        |             |                              |                             |             |      |          |     |                  |
| 06/21/12       | Hermetic UTimeter Glex | G-11499     | 647855                       | 647856                      | 138.8       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 06/21/12       | Hermetic UTimeter Glex | G-11500     | 647855                       | 647856                      | 148.2       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 06/21/12       | Hermetic UTimeter Glex | G-13362     | 647855                       | 647856                      | 142.2       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 06/27/12       | Hermetic UTimeter Glex | G-15297     | 647855                       | 647856                      | 144.4       | 32.4 | -2       | +1  | Juan L. Carrillo |
| 06/21/12       | Hermetic UTimeter Glex | G-16266     | 647855                       | 647856                      | 143.0       | 32.2 | -2       | +2  | Juan L. Carrillo |

f) All Portable Electronic Thermometers must be checked for calibration once per month at two temperatures in the Laboratory.



**MMC UNIT  
MONTHLY TEMPERATURE UNIT VERIFICATION  
AT TWO TEMPERATURES**

LOCATION: Linden, New Jersey

YEAR: 2012

| DATE           | Model Type           | Unit Number | HIGH Nist<br>Thermometer No. | LOW Nist<br>Thermometer No. | TEMPERATURE |      | VARIANCE |     | CALBRATED BY     |
|----------------|----------------------|-------------|------------------------------|-----------------------------|-------------|------|----------|-----|------------------|
|                |                      |             |                              |                             | HIGH        | LOW  | HIGH     | LOW |                  |
| <b>*April*</b> |                      |             |                              |                             |             |      |          |     |                  |
| 04/25/12       | MMC Restricted 30M   | 20029       | 647855                       | 647856                      | 132.4       | 32.2 | -3       | +3  | Juan L. Carrillo |
| 04/02/12       | MMC Restricted 100FI | 22360       | 647855                       | 647856                      | 139.6       | 32.4 | -3       | +1  | Juan L. Carrillo |
| 04/02/12       | MMC Restricted 100FI | 5509        | 647855                       | 647856                      | 139.8       | 32.2 | +3       | +2  | Juan L. Carrillo |
| 04/02/12       | MMC Restricted 100FI | 6119        | 647855                       | 647856                      | 136.2       | 32.6 | +4       | +3  | Juan L. Carrillo |
| 04/27/12       | MMC Restricted 100FI | 6270        | 647855                       | 647856                      | 155.0       | 32.2 | -4       | +8  | Juan L. Carrillo |
| <b>*May*</b>   |                      |             |                              |                             |             |      |          |     |                  |
| 05/29/12       | MMC Restricted 30M   | 20029       | 647855                       | 647856                      | 142.2       | 32.2 | -2       | +4  | Juan L. Carrillo |
| 05/16/12       | MMC Restricted 100FI | 22360       | 647855                       | 647856                      | 138.0       | 32.2 | -2       | +2  | Juan L. Carrillo |
| 05/09/12       | MMC Restricted 100FI | 5509        | 647855                       | 647856                      | 143.6       | 32.4 | +2       | +3  | Juan L. Carrillo |
| 05/29/12       | MMC Restricted 100FI | 6119        | 647855                       | 647856                      | 140.0       | 32.2 | +4       | +3  | Juan L. Carrillo |
| 05/16/12       | MMC Restricted 100FI | 6270        | 647855                       | 647856                      | 136.0       | 32.2 | -4       | -2  | Juan L. Carrillo |
| <b>*June*</b>  |                      |             |                              |                             |             |      |          |     |                  |
| 06/27/12       | MMC Restricted 30M   | 20029       | 647855                       | 647856                      | 140.8       | 32.4 | -3       | +5  | Juan L. Carrillo |
| 06/21/12       | MMC Restricted 100FI | 22360       | 647855                       | 647856                      | 145.0       | 32.2 | -3       | +4  | Juan L. Carrillo |
| 06/21/12       | MMC Restricted 100FI | 5509        | 647855                       | 647856                      | 141.8       | 32.2 | -4       | +3  | Juan L. Carrillo |
| 06/27/12       | MMC Restricted 100FI | 6119        | 647855                       | 647856                      | 141.6       | 32.2 | +5       | +3  | Juan L. Carrillo |
| 06/21/12       | MMC Restricted 100FI | 6270        | 647855                       | 647856                      | 139.0       | 32.4 | -4       | -2  | Juan L. Carrillo |

f) All Portable Electronic Thermometers must be checked for calibration once per month at two temperatures in the Laboratory.

# ANEXO 14. CURSOS DE CAPACITACIÓN DE NORMAS

## 1. Safety and Security (page 1)

AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### Safety & Security

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Module 1: Safety and Security

### Safety, Security & Environmental Standards

- 29 CFR 1910 (OSHA Standards)
- 33 CFR 101 (Maritime Security)
- 40 CFR (Environmental Protection Agency)

Some of the test questions after this section refer to these standards

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AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### Course Objectives

- Safe Work Practices
- Better understanding (of why) we do what we do
- Well-trained field representation
- Reduced Errors
- Customer Confidence
- Professional conduct and performance
- Increased Job Satisfaction
- Elimination of Incidents / Accidents / Claims
- Improved Company Image

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AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### The Role of the Inspector

- Protect -
  - The interests of the Company
  - The interests of our Customer
- Prompt, accurate reporting
- Keeping AmSpec and the Customer informed
- Adherence to industry standards and local requirements
- Adherence to federal, state and local laws
- An ability to respond to unusual circumstances

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AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### Customer Expectations of the Inspector

- Safe Work Practices
- Knowledge of Standards, Practices and Procedures
- Understand Customer Requirements
- Local Knowledge - Terminals - Products - Procedures
- Responsibility
- Punctuality

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AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### Section 2

- PPE
- Respiratory Protection
- Confined Space
- Hearing Conservation

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## 1. Safety and Security (page 2)

AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### PPE - Safety Manual Section 12

- Inspectors working in the field are required to use the following PPE:
- Approved hard hats
- Approved ANSI Z-87.1 safety glasses with side shields, shields or goggles as required
- Protective boots/shoes
- Proper clothing (long sleeves, long pants, FRC if required)
- Proper hand protection as recommended by MSDS
- Fall Protection if necessary – only approved safety harness & lanyards allowed
- Hearing Protection in noisy environments
- Respirators & SCBA as required

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Module 1: Safety and Security

### PPE QUESTION??

- The minimum personal protective equipment required at all times when working in the field is?

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Module 1: Safety and Security

### PPE ANSWER

- Approved safety helmet
- Safety glasses / goggles
- Long sleeved uniform/coveralls
- Approved steel toe shoes/boots

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Module 1: Safety and Security

### Respiratory Protection Safety Manual Section 14

- Inspectors are required to undergo a Pulmonary Function Test and Fit Test prior to use of any respirator. You will be trained in the proper fit, use and care of a respirator.
- You must review the MSDS for the product you will be working with. The MSDS will guide you in the necessity and choice of respiratory protection needed for the task.
- AmSpec does not require you to be completely clean shaven, HOWEVER, many terminals do, and you must be able to pass the fit test. Generally any facial hair will make this impossible.

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### Respiratory Protection

- When donning a respirator, you shall conduct 2 checks:
- Negative Pressure Check:** The hands are placed lightly over the cartridges, blocking them off as the employee attempts to inhale. The respirator should collapse slightly inward from the lower pressure in the mask. If it does not, adjust the respirator straps or the position of the facepiece and try again.
- Positive Pressure Check:** The hand is placed over the exhalation port, blocking it off. The employee then attempts to exhale. The respirator should inflate slightly before leaking air out around the sealing flange. As with the negative pressure test, if the mask does not inflate slightly, adjust its position on the face and try again.

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Module 1: Safety and Security

### SELF-CONTAINED BREATHING APPARATUS (SCBA):

- These units provide a tank of air, a pressure regulator and a facemask as a unit.
- Approved SCBA Units:** All SCBA in use by AmSpec employees must be of the pressure demand type.
- Use of SCBA Units:** SCBA are required for the following situations, and may be required for other situations.
- Open sampling or gauging of cargoes whose H2S level at the hatch opening is greater than 10 ppm.
- Open sampling or gauging of cargoes which emit more than 50 ppm benzene at the hatch opening.
- Open sampling or gauging of some chemical cargoes with high toxicities and/or low PEL (e.g., acrylonitrile above 20 ppm).

## 1. Safety and Security (page 3)

AmSec Field Inspector Training Course  
Module 1: Safety and Security

### Confined Space Entry Safety Manual Section 3

A Confined Space Entry is possibly the most dangerous condition you may encounter as an inspector.

- All confined spaces are to be considered "Permit Required" until pre-entry procedures show otherwise. A Confined space is defined as follows:
- any space with limited means of egress that
- is large enough for entry and for work to be performed, and
- is not designed for continuous human occupancy, that
- contains, or has the potential to contain, a hazardous material, or
- contains a material which has the potential to engulf an entrant,
- has an interior configuration which might cause an entrant to be trapped, or
- contains any other recognized serious safety or health hazard (e.g., radiant heat) that could place entrants at risk.

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Module 1: Safety and Security

### Confined Space

Tests to be conducted prior to entry:

- O<sub>2</sub> level – OSHA requires between 19.5 to 21.0%.
- Toxic tests for known contaminants
- Lower explosive limit (LEL) – the mixture of flammable materials and air in the atmosphere must be below the LEL to ensure against an explosion or fire.

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Module 1: Safety and Security

### Confined Space

Examples of a Confined Space:

- Cofferdams, ships holds, ship's pump room, etc.
- The top of an external floating roof below the top ring, internals of a tank, a grain silo, etc.

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Module 1: Safety and Security

### Confined Space Entry

Authorized Entrants Must:

- Always know the hazards they will face during entry, including the chemical hazards. Employees must have knowledge of the nature of the hazards, the symptoms and consequences of exposure to any substance that might be present in the space as a contaminant. All employees will be informed of these things before they enter the confined space.
- Be provided with and be familiar with the use of all equipment necessary for entry, including such things as ladders and rescue equipment (except where some items of rescue equipment are provided by the client or vessel).

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Module 1: Safety and Security

### Confined Space Entry

Authorized Entrants Must:

- Enter only after a qualified individual has been designated as standby attendant, a proper entry permit has been executed and the Confined Space Entry Checklist has been filled out.
- Stay in constant communication with the attendant to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space.
- Exit from the permit space as quickly as possible whenever the entrant recognizes any symptom of exposure to a dangerous situation or an evacuation alarm is activated.

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Module 1: Safety and Security

### Hearing Conservation Safety Manual Section 11

- Hearing protection is required for work in areas at or above the 85 decibel (dBA) Action Level
- Since you won't have a sound meter with you, common sense should be your guidance. You should always be sure to use hearing protection when working around noise that causes you to raise your voice to be heard, on the interior areas of ships or tanks, around moving and rotating parts and engines, etc.

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## 1. Safety and Security (page 4)

AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### Hearing Conservation

- **Pre-molded Earplugs** - Pre-molded earplugs are plastic devices of fixed dimensions, come in various sizes, and will fit most people. Personnel responsible for fitting and dispensing earplugs will train users on proper insertion, wear, and care.
- **Formable** - Formable earplugs come in just one size. When properly inserted, they provide noise attenuation values that are similar to those from correctly fitted, pre-molded earplugs.
- **Custom Molded Earplugs** - Custom earplugs can be made to fit the exact size and shape of the individual's ear canal. Individuals needing custom earplugs will be referred to an audiologist.
- **Earmuffs** - Earmuffs are devices that surround the ear with cushioning to reduce the level of noise that reaches the ear. Their effectiveness depends on an airtight seal between the cushion and the head.

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Module 1: Safety and Security

### Section 3

- Hazard Communication
- Health Hazards
- First Aid & Bloodborne Pathogens

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Module 1: Safety and Security

### Hazard Communication Safety Manual Section 9

All AmSpec employees have the "right to know" what hazardous materials they might come into contact with during the course of their employment, the correct way to deal with these hazards and how they may protect themselves while exposed to the hazards.

AmSpec has developed a Hazard Communication program to ensure that our employees remain safe and healthy while at work.

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Module 1: Safety and Security

### Hazard Communication

#### MATERIAL SAFETY DATA SHEETS (MSDS)

An MSDS for every hazardous material worked, used or present in the office, field and/or laboratory is to be kept in an easily accessed location in the facility where it is readily available to all employees

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Module 1: Safety and Security

### MATERIAL DATA SAFETY SHEETS (MSDS) - Key Definitions

- **IDLH** - Immediately Dangerous to Life or Health. 15 minutes or less exposure can result in permanent injury or death. AmSpec considers IDLH work high risk work and will not do it unless approved by upper management. Ex: H<sub>2</sub>S above 100 ppm
- **PEL** - OSHA 8-hour Permissible Exposure Level
- **STEL** (Short-Term Exposure Limit) - 15-minute TWA (Time weighted average) concentration that may not be exceeded, even if the 8-hour TWA is within the standards. TWA-STEL are given for contaminants for which short-term hazards are known.

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Module 1: Safety and Security

### MSDS Key Definitions

- **CAS Number** - A unique ID assigned to a product by the Chemical Abstract Service
- **v.d. or s.g.** vapor: vapor density relative to air - will it sink in air?
- **s.g.** specific gravity relative to water - will it float in water?
- **Sol.** solubility in water unless stated
- **NFPA/HMIS Ratings:** 0-4 scale for health (blue), flammability (red), instability or reactive (yellow) or other (white-corrosive, oxidizer, water reactive)

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## 1. Safety and Security (page 5)

AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### Hazard Communication

#### IDENTIFYING CHEMICAL HAZARDS

AmSpec uses the system developed by the National Fire Protection Association to denote relative health, fire and stability (reactivity) hazards. Hazard identification under the NFPA is accomplished by using a diamond shape in which there are smaller diamonds in blue, red, yellow and white. The numbers in the smaller diamonds show the relative hazards of the material for health, fire, stability and special hazards, such as corrosiveness.

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Module 1: Safety and Security

### NFPA Diamond

The NFPA Diamond is a diamond-shaped hazard identification system. It consists of four smaller diamonds arranged in a larger diamond shape. The quadrants are:
 

- Health (Blue):** 4 (Fatal), 3 (Serious), 2 (Moderate), 1 (Minor), 0 (None)
- Flammability (Red):** 4 (Extreme), 3 (Highly flammable), 2 (Flammable), 1 (Combustible), 0 (None)
- Reactivity (Yellow):** 4 (Extreme), 3 (Highly reactive), 2 (Reactive), 1 (Unstable), 0 (None)
- Special Hazards (White):** 0 (None), 1 (Simple Asphyxiant), 2 (Flammable Gas), 3 (Oxidizing), 4 (Highly Toxic, Corrosive, etc.)

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Module 1: Safety and Security

### Questions??

- On the NFPA diamond, the color Red stands for?  
*FIRE*
- On the NFPA diamond, which number represents the highest danger level, 1, 2, 3 or 4?  
*4*
- You are instructed to sample a tank of methyl tertiary butyl ether (MTBE), a new product for you. Where is the first place you should look for information on this material?  
*MSDS*

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Module 1: Safety and Security

### Hazard Communication

#### H2S

- Hydrogen Sulfide: Hydrogen Sulfide, or H<sub>2</sub>S, is a gas which appears as a contaminant in crude petroleum and some petroleum fractions, as well as forming one of the breakdown products of other materials, such as vegetable and animal oils and some other food products and organic fertilizers.
- Requirements for AmSpec employees involved with products which either do contain or may contain H<sub>2</sub>S, include, but are not necessarily limited to the following:

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Module 1: Safety and Security

### Hazard Communication

#### H2S

- Employees must carry at all times a personal electronic H<sub>2</sub>S monitor that alarms automatically at no more than 10 parts per million (ppm) H<sub>2</sub>S.
- The exposure limit of 10 ppm must be observed at all times.
- Employee exposure to H<sub>2</sub>S at levels higher than 20 ppm requires a self-contained breathing apparatus (SCBA) and approval from the Local Manager.
- Employees must also be aware and follow local facility regulations which may be more stringent than the above.

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Module 1: Safety and Security

### Health Hazards (Benzene)

#### Sections 2 & 17

#### REGULATED HEALTH HAZARD REQUIREMENTS

- Plans for addressing employee exposure to regulated health hazards will be made at the corporate level to ensure the plans are applied uniformly in all AmSpec offices.
- These plans will be thoroughly covered during employees initial training. In addition, refresher training will be carried out at prescribed intervals.

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## 1. Safety and Security (page 6)

AmSpec Field Inspector Training Course  
Module 1: Safety and Security

### Health Hazards

- Employees known or suspected to be exposed to chemicals such as benzene over the established level must be monitored.
- Employees found to have been exposed to level of benzene over the action level shall be medically monitored and records kept.
- Employees may be reassigned to jobs which will limit their exposure to certain health hazards as deemed necessary by medical personnel, Safety and management.

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Module 1: Safety and Security

### Safety Discipline Safety Manual Section 4

EMPLOYEE RESPONSIBILITIES:

- It is the responsibility of all AmSpec employees working in marine terminals, marine vessels, tank farms, petroleum refineries or chemical plants to know and comply with the safety regulations of that facility.
- When any violations of the terminal safety regulations are observed, they should be reported to the proper authority within the terminal and also to the individual's supervisor as soon as possible.
- Employees who fail to follow client safety rules may be banned by clients from entering their facilities and may also be terminated by AmSpec for safety violations.

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### Safety Discipline

Each facility will have different rules and regulations that cannot be reviewed entirely in this training. A few common requirements are:

- Make sure you have the proper authorization for entry
- Never enter a restricted area without proper authority and/or plant escort
- Clean up all minor spills immediately.
- Notify plant personnel and supervisors in case of accident or incident
- Use proper means of access. No jumping over open water, climbing fences or walking on unsecured ladders or gangways

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### Safety Discipline

- Always wear approved Personal Flotation Device (PFD) when working within 6 feet of the edge of a vessel
- Never operate valves or switches anywhere on the vessel. Additionally, do not open any hatches, ullage ports or manhole covers without permission. Best practice: have plant or vessel personnel handle this task.
- Always stand up wind when gauging tanks or taking samples
- Always use the ground supplied on your tape, and remember to dissipate static from yourself by touching the tank rail with an un-gloved hand prior to any work.
- Clean up your work site. Do not leave samples, dirty rags or equipment behind.

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Module 1: Safety and Security

### Section 4

- Spill Prevention
- Waste Minimization
- Process Hazard Analysis
- Sample Handling & Transportation

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### Spill Prevention

- Spill containment on a clients facility should be a rare occurrence. Sampling and gauging activities should be conducted in such a manner as to limit the possibility of spills.
- If a spill should occur, notify facility or ships personnel ASAP and your dispatcher. If the spill is of such a nature that it can be cleaned up using a rag or absorbent pad you have on hand, do so.
- If the spill is large or caused by a leak of some type, do not try to clean up or stop the spill. Notify facility personnel ASAP and move to a safe location.

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## 1. Safety and Security (page 7)

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### Waste Minimization

- AmSpec is committed to the reduction and minimization of waste in all company operations. Compliance with the spirit of this policy is required at all levels of AmSpec operations, but is particularly important at the field level.
- All oily rags and used containers are to be disposed of in an appropriate manner.
- At a client facility, use only designated trash receptacles if necessary.
- Treat client facilities as if they were your own home.

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### Sample Handling & Transportation

- In accordance with DOT regulations.
- Chain of Custody and MSDS (or N. American Emergency Response Guide)
- Significant penalties for non-compliance.



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### Sample Handling & Transportation

- Transportation of flammable, toxic, reactive or corrosive liquid samples and flammable, reactive or toxic solid samples by road is covered under Title 49, Code of Federal Regulations issued by the U.S. Department of Transportation (DOT).
- Before samples are transported, some essential information must be taken into consideration. 49 CFR, Part 172.101 lists hazardous materials and the regulations governing their transportation.

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### Sample Handling & Transportation

#### Shipping Papers

- AmSpec Chain of Custody report
- Hazard information, either a MSDS or North American Emergency Response Guide (DOT Guidebook)
- Shipping papers must be carried on the seat of the vehicle next to the driver or in the door pocket on the driver's side while the vehicle is on the road.
- If the driver exits the vehicle before removing the sample box, the shipping papers must be left on the driver's seat during his absence.

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### Sample Handling & Transportation

Marking: Samples must be labeled as soon as possible during the job. All sample labels must be completed to include the following items:

- Proper shipping name of product (use correct tag color)
- Proper CAS # identification code (use correct tag color)
- Visual name and cargo tank/other tank from which sample was obtained
- Time/date sample was taken
- Tag information fully completed

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### Sample Handling & Transportation

#### Sample Containers

- Only standard DOT containers may be used to take samples of hazardous materials; Boston round bottles (in glass or plastic), round and rectangular cans, as well as steel jerrycans and inline sampler devices (for petroleum products and liquid chemicals).
- Containers must be secured in transport boxes that meet all required DOT standards.

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## 1. Safety and Security (page 8)

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Module 1: Safety and Security

### Sample Handling & Transportation

#### Hazardous Samples

- AmSpec employees may use only standard DOT containers to take samples of hazardous materials; dry material must be sampled into an appropriate DOT container (one which will safely contain the hazards of the material), and if not flammable, acutely toxic or reactive, the sample need not be carried in an approved carrier.
- Toxic or reactive solids may be carried in individual DOT packages instead of an approved carrier, but if toxic liquid or semi-liquid materials such as samples containing gold potassium cyanide are transported, they must be in DOT packaging and securely stowed. Such materials may not be carried in the passenger compartment of the vehicle under any circumstances.

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### Sample Handling & Transportation

#### Non-Hazardous Samples

- These may be transported in any way that does not endanger the driver or passengers of the vehicle. They require no labeling beyond that required to identify them and their origin. Any labeling applied must be durable enough to last until the sample is no longer needed.

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### Sample Handling & Transportation

#### Handling Samples

- All samples coming in from the field must be logged onto the *Sample Receipt and Distribution* form and properly tagged.
- If the laboratory has a Laboratory Information Management System (LIMS), the system assigns an appropriate number automatically.

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### Section 5

#### Job Order & Procedures

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### Job Order & Procedures

#### Steps to take before the job

- Check your nomination paperwork
- Read the MSDS or Emergency Guide Information
- Check your PPE, monitor & equipment
- Know where you are going, who you are meeting, what task you are assigned (gauging, sampling, etc.)
- Make sure you have the clearances to get into the plant or port
- Review everything before you head out the door

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### Job Order & Procedures

#### Steps to take on the job site

- Park in a secure area, free from hazards
- Take what you need to do the job
- Check the access to vessel or tank
- No entry into hazardous atmospheres
- Observe ongoing operations in your vicinity
- Don't allow yourself to be rushed

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## 1. Safety and Security (page 9)

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Module 1: Safety and Security

### Job Order & Procedures

Steps to take on the job site

- Question facility personnel for new or nearby hazards, look for new hazards, lack of maintenance, high pressures, leaks, etc.
- Confirm MSDS matches cargo, verify adjacent cargoes are not potential hazards
- Use Safe Access – no jumping, open water
- Leave valve and hand opening to facility personnel.

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### Job Order & Procedures

#### Job Completion

- Take all samples, paperwork & equipment
- Make multiple trips if necessary to maintain one free hand while climbing access ways
- Make notes of found hazards & hindrances
- Secure samples in proper transport boxes
- Secure transport boxes in vehicle
- Clean and properly store all PPE at office
- Turn over samples and paperwork

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Module 1: Safety and Security

### Section 7

AmSpec Safety Records & Initiatives

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### Safety Records & Goals

- Identified safety hazards or environmental concerns or HS&E improvement information from the field are to be communicated for use on future jobs locally and to the Safety Department.

Communicate to HS&E Department by submitting:

- Near Miss Safety Report & Accident Reports
- Job Order completion paperwork showing improvements
- Comments in monthly safety meeting report
- Revisions to checklists or procedures
- Simple identification of the hazard or improvement via email or fax

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### Significant Near Miss

- **Significant Near Miss** – Any unplanned, unexpected occurrence (incident) that does not result in a negative consequence but could have resulted in a serious injury or a significant loss to the company
- Requires safety report submittal identifying unsafe conditions and procedures, possible corrective or control procedures

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### Incident Reporting

As AmSpec's on the job representative, you may at times be the first to witness an incident or accident. While accidents are unfortunate, it is important that we take away lessons learned to prevent them from happening again. Remember, this time you might be a witness, but next time.....

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## 1. Safety and Security (page 10)

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Module 1: Safety and Security

### Your Duties in an Accident

- Secure the injured worker. Make sure to limit his/her exposure to further injury if possible.
- Summon aid immediately.
- Report incidents or accidents to your supervisor ASAP.
- Make some basic notes of the incident: What, When, Where, How, Why of the event.
- Be as precise as possible when recounting your description of incident.
- Cooperate fully with the investigation.

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Module 1: Safety and Security

### Immediate Incident Reporting

Immediately report the following to your supervisor

- All injuries and incidents resulting in property damage at customer's facilities
- All injuries greater than first aid on site or involving 3<sup>rd</sup> parties
- All 3<sup>rd</sup> party claims or potential claims
- All regulatory agency findings.

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Module 1: Safety and Security

### ANY QUESTIONS?

**GOOD**

**HERE ARE SOME FOR YOU**

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## 2. Ethics & Short Cuts (page 1)

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Field Inspector Training Course  
Module 2: Ethics and Short Cuts

### Ethics & Short Cuts

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### Objectives of the Ethics Workshop

- To increase employee awareness of AmSpec's ethical principles.
- To assist employees in making correct, ethical business decisions.
- To clarify procedures should an ethical problem arise.
- To examine business scenarios and provide clear guidelines to employees.

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### Objectives (continued)

- To ensure that all employees understand that the potential criminal, civil and administrative consequences of nonconformance, for both the company and the employee are severe.
- To ensure employees understand that noncompliance will result in internal disciplinary action, including termination.

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### This workshop is not

- Just a sermon on what is right and what is wrong.
- Just a warning of the legal and financial penalties for misconduct.

*This workshop is intended to promote discussion and by so doing to develop a shared understanding of how to function in the ethical workplace.*

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### Ethics (*eth'iks*) n. pl...

- The study of standards of conduct and moral judgement.
- The system or code of morals of a particular person, religion, group, profession, country, etc....

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### The code of morals for a profession, country etc.

Simply put, performing business ethically means abiding by all laws and regulations, whether Federal, State, or local, and also conducting our business with regard to behavior that is acceptable to the moral standards of the country.

It further means abiding by the policies, rules and regulations of the company.

## 2. Ethics & Short Cuts (page 2)

 Field Inspector Training Course  
Module 2: Ethics and Short Cuts

### Abiding by the laws and regulations

In modern developed societies, the system of law is closely related to ethics in that it determines and enforces certain rights and obligations for that society. It also provides for punishment for deviations from these standards. Examples are the laws against stealing, laws against assault, laws against killing, and laws against fraud.

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### Another name for ethics is *morality*

How we behave to ourselves and to each other is a matter of making choices.

For example...  
Whether to tell the truth or to lie; Whether to be generous or greedy; Whether to study to pass an exam or watch TV instead and then cheat in order to pass.

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### Not *all* immoral activity is illegal.

For example, lying is often not illegal... and most people do indeed tell "fib" on occasion....

You can lie and say that you like someone's new shirt when you really think that it's awful.

(NOT UNETHICAL - YOU ARE JUST TRYING TO MAKE SOMEONE FEEL BETTER)

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Module 2: Ethics and Short Cuts

You can lie and tell your wife that you were working late when you actually stopped off for a beer with the boys on the way home.

Not Really unethical as it stands - most folks have done this or similar - BUT - Say the wife is 9 months pregnant and having problems - then YES It is Unethical in most people's opinion.... - Shades of grey!!!!

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Module 2: Ethics and Short Cuts

### How about these....

You can lie and say that you are too sick to come to work when really you just want a day off.  
- *Illegal and Unethical*

You can lie to a customer and give him a result when actually you did not run the test and actually just pencilled in a number.  
- *Illegal, Unethical, and you WILL BE FIRED*

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### AmSpec's Code of Ethics begins

"AmSpec is committed to conducting all operations in accordance with good business ethics. This includes compliance with all applicable laws and regulations and the avoidance of practices that may create even the *appearance* of impropriety"

## 2. Ethics & Short Cuts (page 3)

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Module 2: Ethics and Short Cuts

### The statement is very clear

If you work for AmSpec, you must not do anything that breaks any law.

If you work for AmSpec, you must not do anything that is immoral or improper.

If you work for AmSpec, you must not do anything that could even appear to be immoral or improper.

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Module 2: Ethics and Short Cuts

### Ethics and AmSpec

Our business is founded on the principle of independence and impartiality. Indeed, we formally describe ourselves as being "Independent Inspectors".

Should we ever perform any of our assignments without being totally independent at all times, we are not performing as we said we would and are certainly in *BREACH OF CONTRACT* which is obviously unethical behavior.

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Module 2: Ethics and Short Cuts

### Deceptive Trade Practices

The Law (#17-96) provides that "False, misleading, or deceptive acts or practices in the conduct of any trade or commerce are hereby declared unlawful". It goes on to specifically include:

(7) ... representing that goods or services are of a particular standard, quality or grade

Note: "Defendant may be held liable for Deceptive trade practices even if the defendant did not know that representations were false or did not intend to deceive anyone"

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Module 2: Ethics and Short Cuts

### The RFG Program

The close scrutiny of the EPA has certainly highlighted this type of problem but:

It applies to any reported figure, quality or quantity, because of the statutes against wire fraud and mail fraud.

This prohibits the transmission of false materials by wire, mail, radio, private carrier etc.

It is punishable by 5 years in prison, a fine, or both.

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Module 2: Ethics and Short Cuts

### Example # 1

If a lab result on sulfur is a 1.01, if it is 1.01 and must be reported as such. If it is a 1.01 + or - repeatability or whatever.

If we elect to do a rerun, and we get a .99 it really only serves to confirm that the 1.01 was statistically correct and the 1.01 should be reported.

We could however, justify adding the two results together in this case (both in statistical control) and using the mean as a result. This means we should never just "Run it till it meets specifications" and then report the number we like.

If we run it 10 times and the results are in statistical control, we either treat this as confirming the first result, or we use an average of ALL the results and report this.

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Module 2: Ethics and Short Cuts

### Other examples of unethical business behavior include

- Bribery / Kickbacks - either offering or receiving\*
- Breaches of the Foreign Corrupt Practices Act\*
- Misrepresentation\*
- Client favoritism - bias
- Manipulating quantities / Manipulating results
- Sexual Harassment/Discrimination
- Neglecting environmental and/or safety rules
- Offering preferential information
- Falsification of invoiced charges
- Failing to meet contractual requirements

## 2. Ethics & Short Cuts (page 4)

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Module 2: Ethics and Short Cuts

**\*Most of these are self evident, while others may require some explanation...**

*Read on.*

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Module 2: Ethics and Short Cuts

**KICKBACKS**

A kickback is a payment made to or received from a party for the purpose of improperly securing favorable treatment in regards to a contract.

Also prohibited is the inclusion of any kickback paid into the contract price charged.

AmStar  
Field Inspector Training Course  
Module 2: Ethics and Short Cuts

**Foreign Corrupt Practices Act – FCPA**

The FCPA prohibits illegal activities of U.S. Corporations when conducting operations overseas.

Specifically it prohibits the giving, or offering of payments to foreign individuals, even through a third party, for the purpose of influencing any foreign politician, government organization, or government decision, such as the awarding of business.

AmStar  
Field Inspector Training Course  
Module 2: Ethics and Short Cuts

**Misrepresentation includes**

- Passing off goods or services as those of another
- Using deceptive representations or descriptions in connection with goods or services
- Causing confusion or misunderstanding as to the source, approval, or certification of goods or services

AmStar  
Field Inspector Training Course  
Module 2: Ethics and Short Cuts

**Hot Line**

A 24 hour toll-free hot line is provided for employees to report any breach or perceived breach of business ethics

Line is staffed by an independent company

Calls may be anonymous

All calls recorded and will be investigated by the Compliance officer

AmStar  
Field Inspector Training Course  
Module 2: Ethics and Short Cuts

**Training and Awareness**

All employees are required to have introductory ethics training, which will be repeated at intervals not exceeding 3 years, plus annual refresher training.

Annual refresher training will be by Power-Point module, conducted in the local offices, (much as our "Confined Space" training, for example, is done at the present time).

## 2. Ethics & Short Cuts (page 5)

AmSpec  
Field Inspector Training Course  
Module 2: Ethics and Short Cuts

### Compliance Audits

A compliance audit, using our checklist, will be performed at least every calendar year at all field locations.

This will usually be performed in conjunction with the internal quality audits.

In addition, unannounced audits may be performed. Results will go to the Compliance Officer for information and action as required.

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Module 2: Ethics and Short Cuts

### SHORTCUTS

...or, how to save time and effort, and also get lots of time off

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Module 2: Ethics and Short Cuts

### There are LOTS of ways to save time and effort.

Not doing *Water Cuts* (especially if it is 6 oil or VOO – Nasty Stuff).

Not taking samples properly – grabbing a quart composite rather than at least one sample per compartment.

Only taking temperatures on half the barge and assuming the others are the same.

Since the barge finished load/discharge and was gauged only 4 hours ago on the other dock – it obviously does not need regauged now – that would be a waste of time.

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Module 2: Ethics and Short Cuts

### More

Just using the Chief Engineer's bunker survey data.

Not checking void and ballast spaces.

Just taking shore tank side gauges.

Carrying over a gauge from when you closed the tank yesterday or even grabbing all the samples from the same ship tank so that you will not need to walk between tanks!

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Module 2: Ethics and Short Cuts

### We have seen them all

And they all have one thing in common...

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### If you do them you WILL be caught and you WILL be fired

Short cuts will never be tolerated at AmSpec. You may get away with it for a while but you will eventually get caught out and you will have a lot of spare time on your hands! You are undoubtedly BETTING YOUR JOB that you will not get caught whenever you do this...

## 2. Ethics & Short Cuts (page 6)

Am **3300**  
Field Inspector Training Course  
Module 2: Ethics and Short Cuts

### Potential Consequences

Getting fired might be the least of your problems if... say...  
You do not water cut a barge and the barge pumps off this water directly to a unit...  
People could very well be severely injured and possibly killed  
**BUT** - you did save 10 minutes....

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Module 2: Ethics and Short Cuts

### IF

The client finds out and we get barred.....  
*Not only are you gambling with YOUR OWN job security... you are also gambling with the jobs of EVERYONE in your office and even in other offices.*

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Module 2: Ethics and Short Cuts

### IF

SAY... a barge you loaded gets to its destination and is rejected due to a shortcut having been taken) - Guess what?  
*WE OBT TO PAY FOR ALL EXPENSES AND DAMAGES - FREIGHT - TIME - PLANT SHUTDOWN BECAUSE THEY RAN OUT OF PRODUCT?*  
*But... never mind, you did save 5 minutes right? ...need I go on?*

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Module 2: Ethics and Short Cuts

### When You Sign Your Name

You should feel comfortable that you did the job properly  
That you did it as well as could be done  
That you are a Professional  
That when Your name is on a document, it means something -- to you and to the world

Am **3300**  
Field Inspector Training Course  
Module 2: Ethics and Short Cuts

### Maybe The Worst Consequence

You lose your *SELF RESPECT* !  
You can no longer feel like a professional who deserves respect  
You do not belong in *THIS* company  
*DO IT RIGHT - USE THE CHECKLISTS*

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Field Inspector Training Course  
Module 2: Ethics and Short Cuts

### There is a reason WHY we do what we do

Nobody asks for samples that are not needed  
There *IS* a reason for water cuts  
There *IS* a reason why you need to do comparisons etc...  
There *IS* a reason for your training and why you have checklists and Job Orders

## 2. Ethics & Short Cuts (page 7)

 Field Inspector Training Course  
Module 2: Ethics and Short Cuts

**IF YOU EVER THINK THAT  
SOMETHING IS UNNECESSARY**

DON'T BE AFRAID TO ASK "WHY?"  
*USE YOUR HEAD – OUR JOB IS TO PROTECT EACH  
OTHER, THE COMPANY, AND OUR CUSTOMERS  
BE SAFE, BE PROFESSIONAL, BE AN INSPECTOR NOT A  
GALKER!*

 Field Inspector Training Course  
Module 2: Ethics and Short Cuts

ANY QUESTIONS?

GOOD

HERE ARE SOME FOR YOU

### 3. Sampling (page 1)

AmSpec Field Inspector Training Course  
Module 3: Sampling

# Sampling

4

AmSpec Field Inspector Training Course  
Module 3: Sampling

## Sampling is also covered in

API Chapters 8.1, 8.2, and 17.1

Some of the test questions required after study of this section refers to these standards

It is recommended that these standards be reviewed in conjunction with viewing this course, before taking the written test

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AmSpec Field Inspector Training Course  
Module 3: Sampling

Today we will learn how *and why* we take samples

- Rope and lead weight
- Cage sampler
- Zone sampler
- Scoop sampler
- Closed system samplers
- Hermetic/MMC

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Module 3: Sampling

Many people take the view that sampling is not as important as measurement.

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Module 3: Sampling

**WRONG**



Sampling is without doubt MORE important than gauging.

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Module 3: Sampling

## Claims

The majority of claims, errors made and customer concerns stem from QUALITY, not QUANTITY discrepancies.

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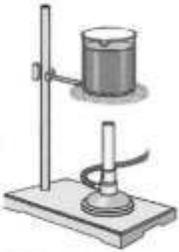
### 3. Sampling (page 2)

AmSpec Field Inspector Training Course  
Module 3: Sampling

**Analysis results**

Can only *ever* be as good as the sample that is submitted for testing.

A bad sample can affect the price of the entire cargo



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Module 3: Sampling

**Examples**

Often, a single one quart sample determines the price of an entire cargo. Poor samples can result in demurrage claims and also affect product that is not related to the movement. Eg: - off-spec product commingled in a tank with good product

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Module 3: Sampling

The key word in sampling is

**REPRESENTATIVE**

The sample must be an accurate reflection of the product sampled

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Module 3: Sampling

**Example**

API gravity in a shore tank can differ by several points between the top of the tank and the bottom.

*QUESTION: Would the lower API be at the top, or at the bottom, or either?*

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Module 3: Sampling

**Answer**

Products with lower API's are heavier by definition and normally would tend to go to the bottom of the tank.

This is not always true if the tank is being heated, mixed, or recently moved.

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AmSpec Field Inspector Training Course  
Module 3: Sampling

One of the major obstacles to getting a representative sample is the phenomenon known as stratification

Products do not always remain well mixed, or in a homogeneous state

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### 3. Sampling (page 3)

AmSpec Field Inspector Training Course  
Module 3: Sampling

When a tank is stratified, any single level sample is NOT a representative sample of the entire contents of the tank.

*QUESTION: What type of sample should be taken to avoid this problem?*

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Module 3: Sampling

**Answer....**

An "All Level" or "Running average" sample if correctly taken will ensure you get a portion from every level of the tank.

Upper, Middle, Lower samples allow us to check for stratification in the lab.

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Module 3: Sampling

**Sample Types**

All level, Running average, Spot sample, Upper, Middle, Lower, Top, Bottom, Pipeline, Spigot Samples, Dead bottom, Manifold, First foot, OBQ, Volumetric composites, LPG, RVP, Gas station, Auto Samples

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Module 3: Sampling

**Note: before sampling you must have an idea of the tank level and the level of any water bottom. – WHY?**

You cannot know where to pull your UML samples from (or the top sample if required)

You need to know the INNAGE to determine where to take the samples – we will explain more in a moment....

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Module 3: Sampling

**If you don't know if there is water or not**  
You could accidentally get into the water layer and ruin the sample (got high water etc.)

**Remember Always**  
If you find water, sample it  
Note that if the API of the product is <10 – The water may be ON TOP!!!!

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Module 3: Sampling

**Sample containers should be flushed with the product to reduce any risk of contamination.**

This should be done every time even though we use new bottles for every job

New bottles can get contaminated with dust, water and other debris while in storage

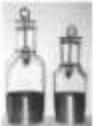
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### 3. Sampling (page 4)

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Module 3: Sampling

#### All Level sample

A stoppered bottle is lowered to the bottom of the tank, above any water that may be present, the stopper is jerked out, and the bottle is withdrawn at a constant speed



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Module 3: Sampling

**Question** - Can the bottle be full?

**Answer** - No... the bottle must be at most 85% full to be sure that it is truly representative - discard and repeat the operation if more than 85% full.

If the bottle were full there is no way to know at which point in the tank it became filled

**ALSO...** If the bottle is completely full, it will EXPLODE if it is heated! (Like in the trunk of your car for example...)

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Module 3: Sampling

#### Running average

A bottle, either unstoppered, or with a hole in the cap, is lowered to the bottom of the tank and immediately withdrawn at a controlled rate - once again the bottle should not be more than 85% full.

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Module 3: Sampling

#### Spot sample

1. A stoppered bottle is lowered to a specified level, the stopper is jerked out and the bottle allowed to completely fill.
2. A zone sampler is lowered to a specified level, withdrawn and the contents transferred to a sample bottle.



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Module 3: Sampling

#### Upper/Middle/Lower

This is simply three spot samples from a tank, drawn as follows:

- Mid point of the upper third
- Mid point of the middle third
- Mid point of the lower third

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Module 3: Sampling

#### Note:

This is sometimes (in error!!!) called "top/middle/bottom"

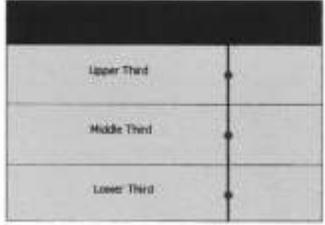
We never composite in the field. The individual samples are taken to the lab for composition.

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### 3. Sampling (page 5)

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**Example**



Upper Third

Middle Third

Lower Third

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**Top and Bottom Samples**

A Top sample is a spot sample drawn normally 6 inches (6") below the surface of the liquid

A bottom Sample is a spot sample drawn at a specified height (i.e. 6") above the bottom of the tank.

**Pipeline Samples**

Pipeline samples are normally taken before and after any transfer to confirm the contents of a pipeline at the time.

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**Spigot Samples (Shore Tanks)**

Are not representative of anything !

Are NEVER to be taken except in very rare special cases and only then when you are SPECIFICALLY instructed to by your Manager. If ever taken, the "Spigot Sample" form explaining why this was needed must be completed and turned in.

Using Unauthorized sampling methods WILL result in severe disciplinary action, up to and including immediate termination

If anyone (other than your Manager) tells you to take a Spigot or other unauthorized Sample -- STOP and Report it to your manager at once

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**Manifold Samples**

Samples are normally taken at the the start of loading. The sample is taken at a point immediately after the cargo loading hoses where the cargo enters the vessel's system. This allows identification of the source of contamination, i.e. if the first foot is off-test.

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**Question:**

You are going to load a cargo of jet fuel. What color bottle would you initially use to take the "line before" sample?

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**Answer - FLINT**

Think about it... The reason you are taking this sample is not "Its on my orders..." it is to check the VISUAL APPEARANCE of the product.

Some people answer this incorrectly because they know that Jet samples are normally kept in Amber bottles to prevent light affecting the Jet Fuel.

This sample is an exception. You need to be able to see what is in there - Same with the first foot.

Take in flint - Keep in Amber

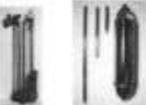
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### 3. Sampling (page 6)

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#### Dead Bottom Sample

A thief, a zone sampler, a scoop sampler, or a bacon bomb is used to obtain a sample at the very bottom of a compartment. The main use of this is to sample water bottoms.



Thief Sampler Bacon Bomb

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#### First Foot Sample

This is a sample obtained normally using a bottle and rope, or a sample cage, after a small amount of product has been loaded into a tank. Again we need a clear bottle to verify appearance.

On occasion loading will be suspended pending lab analysis of the first foot.

Remember to observe Static Electricity relaxation time requirements as appropriate for the product! Read job orders and MSDS!

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#### Question

What would be your action if you are loading #2 oil with a flash point specification of 140F and the first foot flashes at 136F ?

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#### Answer

You DON'T "Put some more on to see if it gets better" .... that is NOT our job!

You DO ... Call your office for guidance.

You SHOULD have all the samples we need to find out where the problem is

We need to establish and advise our customer(s) re ...

What's the Flash on the Shore Tank?, What's the previous Cargo(es) on the barge, What's the flash on the "dockline before" sample

And call our customer for their decision

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#### OBQ Samples

Samples taken of the residues in the bottom of a cargo space prior to load.

Use zone sampler or preferably a scoop sampler.

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#### Volumetric Composites

Cargoes are usually sold "in bulk" rather than on a tank by tank basis. Therefore samples must represent accurately the "entire" parcel. If we just mixed a quart from each tank the resulting composite would not be really representative as some compartments are bigger than others.

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### 3. Sampling (page 7)

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#### Composites, continued

For representative sampling the individual tank samples are mixed in proportion to their volumes. This is done in the lab, not in the field. That is why the lab needs a copy of the ullage report.

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#### LPG Samples

A specially made "bomb" is connected to a sample connector at either the vessel's pump or at the tank top. The bomb has an inlet and an outlet. Product is circulated to ensure the container is well flushed. The valves are then closed and the bomb disconnected and taken back to the lab.

MUST NEVER be 100% full.

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#### RVP Samples

RVP requires certain precautions to be taken to minimize any light end loss.

- Use running average method.
- Do not transfer sample to another container.
- Immediately cap the bottle and invert to check for leaks.
- Tag sample - including "RVP".
- Place samples "on ice" as soon as possible.

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#### Gas Station Samples

Samples are taken from the pump nozzle using a special nozzle extension piece. The extension reaches to the bottom of the container to prevent light end loss.



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#### Closed Sampling - MMC or Hermetic

Consists of a sampling device attached to an MMC or Hermetic tape unit. The unit connects to a valved standpipe known as a vapor lock. The device prevents the escape of vapors from the cargo tank to the atmosphere. On many vessels and in some ports this is mandatory.



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#### MMC/Hermetic Sampler Types

Most of these samplers are a "zone type" with a top flap and bottom valve. This means that only spot type samples can be obtained.

Newer types also provide a restricted flow orifice for pulling running averages. We have not been too impressed with these to date.

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### 3. Sampling (page 8)

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Module 3: Sampling

#### Discussion Question

Our customer has requested that we run individual RVP samples on each barge tank on a Hermetic or MMC equipped barge... Do we have a problem?

Answer - Yes we do.... As discussed the RVP sample cannot be transferred from one container to the other. On a closed system this means we can not get a proper RVP sample. We have to do what we can, but in such a case, we should endorse our lab certificates to this effect

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Module 3: Sampling

#### Sample Must Do's

Transport in accordance with DOT regulations  
Carry Chain of Custody and MSDS (or N. American Emergency Response Guide)  
Label at the earliest opportunity to prevent confusion.  
Fully complete labels  
Do not use unrecognized abbreviations or unofficial product names. Use AmSpec SR1 Forms - if the sample is going out of our possession we use an SR1 to continue the traceability of the sample.

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Module 3: Sampling

#### Sample Must Do's

Samples have to be tracked from "cradle to grave"  
Never draw a sample of ANYTHING for ANYONE without getting a duplicate for AmSpec  
Get any receipts signed - no more "we don't have the sample because the inspector didn't leave it on board." or "no, we haven't got the sample yet so the barge can't load."

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Module 3: Sampling

#### In Line Samplers (Auto Sampler)

An inline sampler (also known as a Jiskoot sampler) is an automatic device located in the line that takes a small sample (bite) at regular intervals from a cargo as it is being either discharged or loaded.

Most common use is for crude oil.

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Module 3: Sampling

#### Operation

The unit consists of a mixer, a sampling probe, a controller and a receiver (fancy word for a sample can)

#### Mixer

Normally an impeller device located in the pipeline directly upstream of the sample probe.  
This ensures that the sample is well mixed which is particularly important when water is present.

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Module 3: Sampling

#### Probe

A tube open in the middle of the pipeline through which the sample is drawn and sent to the receiver.

#### Receiver

A container for the sample, usually a specialized 5 gallon can which in appearance resembles a fire extinguisher  
Receivers must be thoroughly cleaned and inspected and usually sealed before use.  
Inspectors are usually responsible for inspecting (for cleanliness), sealing and setting the cans.  
Contents must be well mixed (Usually with a special "Pump") before drawing off samples for analysis.

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### 3. Sampling (page 9)

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#### Controller

The clever part of the device is set according to the parcel size and the API gravity

May be flow proportional or time proportional

Flow proportional is better.... Why?

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#### Time Proportional vs. Flow proportional

Time proportional would be fine if ships discharged at the same speed all the time. - Unfortunately they don't.

A time proportional sampler just takes a sample say - every second REGARDLESS OF the FLOW RATE....

Ships always pump slower on start up and when stripping - so time proportional samplers tend to get MORE water and Sediment than there actually is on the vessel.....

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Module 3: Sampling

#### Sample rope

Static?  
Only use ropes made 100% from natural fibers such as cotton. Synthetic ropes or natural ropes with synthetic fiber cores can cause STATIC electricity and fires/explosions

Dirty?  
Don't use the 6 oil rope on the jet fuel or the gasoline.... You will obviously ruin the sample

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Module 3: Sampling

#### Standpipes

Slotted?  
If the standpipe is not slotted don't use it. Samples and gauges WILL BE WRONG if you do.

Rusty?  
Take care if you see rust in the standpipe. Many products have specifications for particulate matter and if you get rust in the sample it will appear to be "Oil-Spec".

As always - if in doubt - CALL YOUR OFFICE

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#### Sample I.D.

Always make sure that every sample is fully labeled....

- Date/Time/Location
- Tank number / Before or After
- Vessel
- Upper? Running average? RVP?
- Product Name
- Safety Information (Hazard Diamond Complete)
- Your Name
- Etc.

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Module 3: Sampling

#### Shortcuts

Don't take shortcuts - You will lose your job.

- Spigot samples
- Not sampling all compartments
- Poor labeling
- Pulling composite samples in the field
- One sample per tank - composites are made in the lab.
- Remember the old adage... "If you gauge it - get a sample. If you sample it - get a gauge".

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### 3. Sampling (page 10)

 Field Inspector Training Course  
Module 3: Sampling

#### Sample Accountability / Orders

For Example.....  
If your job orders call for UML samples open and close, and on the close there is only 2 feet left in the tank, you obviously cannot do what the orders say (e.g. UML on 2' ... No-can-do, right...)  
PLEASE make a note on your orders or time log WHY you didn't get what was requested.  
Close the loop so we know... what happened and why  
Same for any other deviation from Job Orders. - EXPLAIN WHAT HAPPENED PLEASE  
Keep good records

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Module 3: Sampling

ANY QUESTIONS?

GOOD

HERE ARE SOME FOR YOU

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#### 4. Temperatures (page 1)

AmSpec Field Inspector Training Course  
Module 4: Temperatures

Temperatures

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Module 4: Temperatures

Temperatures are also covered in

- API Chapters 7, 17.1 & 17.2
- Some of the test questions required after study of this section refers to these standards
- It is recommended that these standards be reviewed in conjunction with viewing this course, before taking the written test

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Module 4: Temperatures

WE WILL EXAMINE

- NEED FOR ACCURACY
- EQUIPMENT TYPES
- CALIBRATION
- IMMERSION TIMES
- FINANCIAL CONSIDERATIONS
- SPECIAL CASES

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Module 4: Temperatures

WHY TAKE TEMPERATURES?

- Without temperatures, we would only be dealing in observed (gross) numbers - TOV or GOV
- It would be impossible to compare "apples to apples" unless all numbers were corrected to the same standard temperature

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IN OTHER WORDS

WITHOUT TEMPERATURES... EVERY TIME WE SHIPPED ...SAY... FROM CANADA TO TEXAS WE WOULD HAVE AN APPARENT GAIN... WHY?



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VOLUMES MUST BE CORRECTED

ANY SUBSTANCE WILL EXPAND AND CONTRACT AS THE TEMPERATURE CHANGES

THE RATE AT WHICH A SUBSTANCE EXPANDS AND CONTRACTS IS CALLED THE "COEFFICIENT OF EXPANSION" (C.O.E.)

THE C.O.E. IS HIGHER FOR LIGHTER SUBSTANCES i.e. GASOLINE EXPANDS WITH TEMPERATURE AT A FASTER RATE THAN OIL.

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#### 4. Temperatures (page 2)

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Module 4: Temperatures

### DENSITY AND GRAVITY

DENSITY (AND GRAVITY) ARE DEFINED AS: WEIGHT PER UNIT OF VOLUME

SO...IF THE VOLUME INCREASES, THE DENSITY REDUCES.

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Module 4: Temperatures

### LET'S SAY

WE HAVE 2.2 LBS (1 KILO) OF A LIQUID IN A VOLUME OF 1 LITER.  
GIVEN IT HAS A DENSITY OF 1.0000, WHAT WILL BE IT'S DENSITY IF THE LIQUID IS HEATED UNTIL IT EXPANDS TO 2 LITERS?  
DID THE WEIGHT OF LIQUID CHANGE?



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Module 4: Temperatures

### ANSWER

0.5000 IS CORRECT - THE VOLUME DOUBLED SO THE DENSITY HAD TO BE HALVED. THE WEIGHT MUST STAY THE SAME.

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### THEREFORE

OBSERVED VOLUME x DENSITY = WEIGHT

1 LITER x 1.0000 = 1 KILO  
2 LITERS x 0.5000 = 1 KILO

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### WE USUALLY WORK IN G.S.V. BARRELS:

IN THE SAME WAY - JUST LIKE A WEIGHT WOULD - THE CORRECTED (G.S.V.) VOLUME REMAINS CONSTANT.

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Module 4: Temperatures

### G.S.V. CONTINUED

- OBSERVED VOLUME \* TEMPERATURE FACTOR = CORRECTED VOLUME
- THE TEMPERATURE FACTOR IS BASED ON THE DENSITY CHANGE.
- G.S.V. IS ALWAYS THE VOLUME AT 60F. OUTSIDE OF THE UNITED STATES IT IS 15 C. (you see this on load port documents)

4. Temperatures (page 3)

AmStac Field Inspector Training Course  
Module 4: Temperatures

### STRATIFICATION

MANY PRODUCTS ARE COMPOSITES OF DIFFERENT MATERIALS AND CAN BE SUBJECT TO STRATIFICATION DUE TO BOTH TEMPERATURE AND DENSITY VARIANCE.

THIS ONCE AGAIN UNDERLINES THE IMPORTANCE OF GOOD SAMPLING.

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AmStac Field Inspector Training Course  
Module 4: Temperatures

### TEMPERATURE TECHNIQUES - GENERAL:

PER A.P.I. CHAPTER 17.1, THE FOLLOWING SHOULD BE NOTED:

PORTABLE ELECTRONIC THERMOMETERS (THERMOPROBES) ARE PREFERRED OVER THE "WOODBACK" VARIETY.

PROBES SHOULD BE CHECKED "FREQUENTLY" INCLUDING BOTH IMMEDIATELY BEFORE AND AFTER A CARGO TRANSFER OPERATION.

Please record your probe "Field Checks" on your Time Log

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AmStac Field Inspector Training Course  
Module 4: Temperatures

### A.P.I. CHAPTER 7 REFERS TO THERMOMETERS AND THERMOPROBES

#### NUMBER OF OBSERVATIONS

IF THE TANK HAS OVER 10 FEET OF PRODUCT, OR MORE THAN 5000 BBLs - AT LEAST THREE (3) MEASUREMENTS MUST BE TAKEN - ONE EACH IN THE MIDDLE OF THE UPPER, MIDDLE, AND LOWER THIRDS OF MATERIAL.

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Module 4: Temperatures

### Example

Upper Third

Middle Third

Lower Third

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Module 4: Temperatures

### SMALL VOLUMES

IF THE TANK HAS LESS THAN 10 FEET OF PRODUCT, OR LESS THAN 5000 BBLs - ONE TEMPERATURE IS USUALLY ADEQUATE. A TEMPERATURE SHOULD BE TAKEN WHENEVER THERE IS SUFFICIENT QUANTITY TO IMMERSE THE PROBE

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Module 4: Temperatures

### LET'S SAY

YOU TAKE UPPER, MIDDLE, AND LOWER TEMPERATURES ON A VESSEL AND GET THE FOLLOWING:

UPPER - 137 F  
MIDDLE - 134 F  
LOWER - 122 F

WHAT WOULD YOU DO?

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#### 4. Temperatures (page 4)

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Module 4: Temperatures

### A.P.I INDICATES THAT

IF YOU HAVE MORE THAN 2 DEGREES VARIANCE - TAKE EXTRA READINGS TO ENSURE A CORRECT AVERAGE IS OBTAINED.

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Module 4: Temperatures

### WHY USE PROBES ?

- MORE ACCURATE - CAN BE READ TO 0.1F (CUPCASES READ TO 0.5F)
- LESS MESS - DON'T HAVE TO BRING OUT FOR EACH READING. (ALSO NO COOLING -- SINCE IT STAYS IN THE LIQUID!)
- MUCH - MUCH - QUICKER!

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Module 4: Temperatures

### IMMERSION TIMES

WHEN WE GET ANY KIND OF TEMPERATURE, YOU ARE IN REALITY, READING THE TEMPERATURE OF THE THERMOMETER OR PROBE - THAT IS BEING HEATED OR COOLED BY THE MEDIUM AROUND IT.

OF COURSE, THIS IS NOT AN INSTANTANEOUS PROCESS, AND REQUIRES A TIME INTERVAL - THE IMMERSION TIME - FOR COMPLETE STABILIZATION.

THIS IS THE AREA WHERE OUR PROBE REALLY OUTCLASSES THE WOODBACK.

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Module 4: Temperatures

### IMMERSION TIME EXAMPLES

THE FOLLOWING GUIDELINES ARE FROM API CHAPTER 7 WOODBACKS.

| GRAVITY       | IMMERSION TIME (MINUTES) |            |
|---------------|--------------------------|------------|
|               | IN MOTION                | STATIONARY |
| OVER 50.0     | 5                        | 10         |
| 40 -> 49      | 5                        | 15         |
| 30 -> 39      | 12                       | 20         |
| 20 -> 29      | 30                       | 35         |
| LESS THAN 20: | 35                       | 60.        |

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Module 4: Temperatures

### EVEN WORSE

THESE TIMES ARE FOR TANKS WHICH ARE STABLE - WITH LESS THAN A 5 DEGREE SPREAD. IF MORE THAN A 5 DEGREE SPREAD, THE TIMES INCREASE EVEN MORE !!! - EXAMPLE: < 20 API GOES TO 80 MINUTES.

CAN YOU IMAGINE - IF WE HAD A 42 TANK #6 OIL SHIP...

TIME LOG...

NOV 2nd 2006 0400 - COMMENCE INSPECTION  
NOV 4th 2006 1200 - COMPLETE INSPECTION

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Module 4: Temperatures

### TWO AND A HALF DAYS FOR TEMPERATURES

TRY AND EXPLAIN THAT DELAY TO A CUSTOMER

LET'S LOOK AT THE SAME THING - IMMERSION TIMES - FOR PROBES...

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#### 4. Temperatures (page 5)

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Module 4: Temperatures

### IMMERSION TIME EXAMPLES

PROBES

| GRAVITY      | IMMERSION TIME |            |
|--------------|----------------|------------|
|              | IN MOTION      | STATIONARY |
| OVER 40.0    | 30 seconds     | 5 minutes  |
| 20 - > 40    | 45 seconds     | 30 minutes |
| LESS THAN 20 | 75 seconds     | 30 minutes |

NOW THAT'S BETTER ISN'T IT... ESPECIALLY FOR "IN MOTION" - WHICH MEANS.....?

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Module 4: Temperatures

### "In Motion" Means

- Rather than just letting the probe sit still in the liquid, you repeatedly raise and lower the probe 1 foot above and below the desired depth.
- This prevents the cold probe "chilling" the surrounding product
- You can simply check the readout as you do this - when it stops changing - it has stabilized.

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Module 4: Temperatures

### JUST IN CASE

IF YOU HAVE TO USE A WOODBACK...

IMMERSION TIMES MAY BE REDUCED BY LOWERING THE THERMOMETER INTO THE PRODUCT FOLLOWED BY REPEATEDLY FILLING AND EMPTYING THE CUP-CASE.

WHEN THE TEMPERATURE STABILIZES - RECORD THE READING.

DO YOU READ THE TEMPERATURE WITH THE CUP-CASE FULL OR EMPTY?

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### Full, Of Course

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### VERIFICATION / CALIBRATION OF EQUIPMENT

IN THE PAST IF SOMEONE WERE TO ASK.. "WHEN WAS YOUR PROBE (OR WOODBACK) LAST CHECKED OUT", THE ANSWER MIGHT HAVE BEEN UNCERTAIN

NOW WE CAN ANSWER WITH CONFIDENCE... OUR FIELD CALIBRATION BOOK IS AVAILABLE FOR VIEWING IN THE OFFICE TO WHOEVER WANTS TO CHECK IT OUT..

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### I SUPPOSE IT'S ONLY FAIR

SINCE THE CUSTOMERS PAY GOOD MONEY FOR US TO "MEASURE" THINGS, THEY EXPECT US TO HAVE TOOLS THAT WILL DO THE JOB RIGHT, AND PRODUCE THE RIGHT DATA.

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4. Temperatures (page 6)

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Module 4: Temperatures

**API RECOMMENDS**

WOODBACKS...  
VERIFIED AGAINST A CERTIFIED THERMOMETER  
ONCE PER YEAR

PROBES...  
RE-STANDARDIZED ANNUALLY, PLUS  
VERIFICATION CHECKS ONCE PER DAY OR  
BEFORE EACH USE (WHICHEVER IS LESS  
FREQUENT)

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Module 4: Temperatures

**WE DEMAND BETTER**

*PLUS WE HAVE THE RECORDS TO  
PROVE THAT WE DO IT RIGHT!*

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Module 4: Temperatures

**FINANCIAL CONSIDERATIONS**

DOING IT WRONG.....

LET'S IMAGINE YOUR PROBE IS OFF A COUPLE OF  
DEGREES...

YOU WORK UP A 550,000 BARREL CARGO AND GET THE  
CLOSING TEMP IN THE SHORE TANK AS 75 WHEN IT  
SHOULD HAVE BEEN 77....

DOESN'T SEEM MUCH DOES IT? - WHAT  
DIFFERENCE DOES THIS REALLY MAKE?

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Module 4: Temperatures

**A LARGE DIFFERENCE**

THIS CUSTOMER BUYS ON THE SHORE TANK FIGURE  
RECEIVED

2 DEGREES CHANGES THE FACTOR FROM .9933 TO .9944  
(USED A 20.0 API)

Thus....  
 $550,000 \times .9933 = 546,315$  GSV  
 $550,000 \times .9944 = 546,920$  GSV  
 DIFFERENCE 605 BBLs

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**605 BBLs**

AT SAY... \$80.00 A BARREL IS \$48,400  
"YOU CAN CALL HIM UP ! - I DON'T WANT TO....!"

I GUARANTEE THAT HE WILL NOT BE A VERY  
HAPPY!

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Module 4: Temperatures

**FURTHER TEMPERATURE  
CONSIDERATIONS**

THE NEXT SLIDE SHOWS THE ARRIVAL  
TEMPERATURES ON A LOADED CRUDE VESSEL

The vessel is coming from West Africa, and loaded  
18 days ago

The vessel is single hulled

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#### 4. Temperatures (page 7)

AmSpec Field Inspector Training Course  
Module 4: Temperatures

### THE "M.V. ANYSHIP"

Average Temps per Tank....

|      |      |      |      |
|------|------|------|------|
| 79.3 | 75.2 | 75.8 | 73.7 |
| 86.4 | 82.1 | 82.1 | 81.0 |
| 81.0 | 77.2 | 77.2 | 75.3 |

IS THIS A NORMAL DISTRIBUTION (FOR AN "UNHEATED" CARGO)?  
WHY ARE THE TEMPERATURES DIFFERENT - WHEN LOADPORT  
SHOWS ALL TEMPERATURES TO BE WITHIN 1 DEGREE?

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Module 4: Temperatures

### CONSIDERATIONS

- Center tanks are usually warmer than wings as they are more insulated from the sea water temp.
- Aft tanks are usually warmer as they are nearer the engine room and heated bunker tanks.
- In this case, the temps look good – It would be unusual if they were all the same.

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Module 4: Temperatures

### COMPARISONS

IF YOU ARE CONDUCTING AN INVESTIGATION INTO A CARGO TRANSFER DIFFERENCE, AMONG THE VERY FIRST THINGS TO "EYEBALL" ARE THE TEMPERATURES.

DO THEY LOOK RIGHT?  
HOW DO THE OPENING TEMPS COMPARE TO CLOSING TEMPS?  
HOW DOES THE SHIP COMPARE TO SHORE TEMPS?  
WHAT WAS THE WEATHER?

THE SOLUTION TO A DISCREPANCY IS OFTEN VERY OBVIOUS!

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Module 4: Temperatures

### Remember

- Oil is a good insulator.....They fill heating radiators with it because it retains heat quite well
- Do not expect to see massive temperature changes in a short period unless it is being heated

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Module 4: Temperatures

### EXAMPLE

IT IS SUMMER TIME IN CORPUS CHRISTI...

CARGO - # 2 OIL - API 32.2  
OPENING S/T TEMP - 88 F. (237,889 BBLS GSV)  
CLOSING S/T TEMP - 76 F. (123,845 BBLS GSV)  
DELIVERED THEREFORE = (114,044 BBLS GSV)  
SHIP DATA-AV. TEMP 87 F. (114,762 BBLS GSV)

DIFFERENCE (GAIN)            71.8 BBLS (0.63%)

WHAT'S WRONG WITH THIS PICTURE?

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Module 4: Temperatures

### SOME "GAUGERS" WOULD ISSUE A PROTEST AND GO HOME

WE WANT AMSPEC TO BE BETTER THAN THAT!

THE THING TO DO RIGHT AWAY WOULD BE TO GO CHECK THE CLOSING SHORE TANK TEMP.

IF IT IS TOO LATE, IMMEDIATELY ADVISE THE OFFICE OF YOUR SUSPICIONS SO THAT THEY CAN INFORM ALL INTERESTED PARTIES.

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#### 4. Temperatures (page 8)

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Module 4: Temperatures

**IT APPEARS THAT THE TEMPERATURE OF 76 ON THE SHORE TANK IS WRONG**

LET'S REWORK IT FOR 88 DEG F - SAME AS THE OPEN.

$124,743 \times .9873 = 123,159$  (NEW GSV FOR 88 DEGREES)

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Module 4: Temperatures

**NEW COMPARISON**

|                    |         |
|--------------------|---------|
| OPEN S/T GSV       | 237,889 |
| REVISED GSV CLOSE  | 123,159 |
| DELIVERED          | 114,730 |
| VESSEL FIGURE GSV: | 114,762 |
| NEW DIFFERENCE     | 32 BRLS |

NOW THAT'S BETTER!!!!!!

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**REAL INSPECTORS**

ARE LIKE GOOD DETECTIVES...

LOOK FOR THE CLUES... THE ANSWERS TO THE PROBLEM ARE OFTEN VERY OBVIOUS.

REAL INSPECTORS GET SATISFACTION FROM FINDING A PROBLEM AND FIXING IT - GAUGERS USUALLY JUST WRITE A PROTEST - AND OFTEN FORGET TO DO THAT!!

AMSPEC WANTS TO HAVE THE BEST "REAL INSPECTORS" IN THE INDUSTRY.

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Module 4: Temperatures

**SPECIAL CASE - 1 :**

YOU BOARD A SHIP EQUIPPED FOR M.M.C CLOSED SYSTEM GAUGING.

YOU FIND THAT THE MMC STANDPIPES ARE NON-STANDARD AND AMSPEC'S MMC DOES NOT FIT

WHAT DO YOU DO?

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Module 4: Temperatures

**As always - CALL THE OFFICE**

- We need to get permission from U.S. Customs before we use Ships Equipment
- We also need to verify that the vessels equipment is calibrated - both for Gauging and for Temperatures
- We also need to issue a letter of protest to the vessel
- If ship's equipment has to be used verify the MMC/UTI against your calibrated thermoprobe

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Module 4: Temperatures

**SPECIAL CASE - 2:**

*PRESSURIZED GASES*  
DO NOT OPEN THE HATCH....!

ON GAS TANKERS, YOU WILL USUALLY HAVE TO USE THE REMOTE READOUTS TO OBTAIN THE TEMPERATURES OF THE VAPOR AND THE LIQUID CARGO.

IN SUCH CASES, ACCURACY AND CALIBRATION IS HARD, SOMETIMES IMPOSSIBLE TO VERIFY. IF YOU CAN, AT LEAST COMPARE REMOTE READOUTS TO LOCAL READOUTS AT THE TANK.

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#### 4. Temperatures (page 9)

AmSpec Field Inspector Training Course  
Module 4: Temperatures

SPECIAL CASE - 3:

**ASPHALT**

- ...IT'S HOT
- USE A HIGH TEMP PROBE...
- DON'T TOUCH THE TIP
- CLEAN UP A.S.A.P.
- PROBE WILL TAKE SOME TIME TO STABILIZE.

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Module 4: Temperatures

SPECIAL CASE - 4:

- **MOLTEN SULFUR**
  - ABOUT 400 DEGREES
  - DON'T USE OUR PROBES BECAUSE IT WILL BREAK THEM
  - PROCEDURES WILL VARY BY TERMINAL, BUT USUALLY REMOTE READOUTS/DIAL THERMOMETERS ARE USED

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Module 4: Temperatures

ANY QUESTIONS

GOOD

HERE ARE SOME FOR YOU

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## 5. Gauging & Measurement (page 1)

AmSpec Field Inspector Training Course  
Module 5: Gauging & Measurement

Gauging/Measurement

AmSpec Field Inspector Training Course  
Module 5: Gauging & Measurement

Gauging & Measurement are also covered in  
API Chapters 3.1, 3.2, 17.1 & 17.2

Some of the test required after study of this section refers to these standards

It is recommended that these standards be reviewed in conjunction with viewing this course, before taking the written test

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Module 5: Gauging & Measurement

PROBLEMS AND SITUATIONS IN GAUGING AND MEASUREMENT

In this section we will be looking at measurement - not how to take a gauge. Not just the correct method, but also some of the problems and situations which might arise.

As measurement is related to volumes, we should start by making certain that we are all familiar with the definitions of volume;

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Module 5: Gauging & Measurement

DEFINITIONS

T.O.V., G.O.V., G.S.V., N.S.V., T.C.V.

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Module 5: Gauging & Measurement

**T.O.V. (TOTAL OBSERVED VOLUME)**  
This is everything in a tank at the observed temperature. Includes the product, free water and sediment and water (S&W)

**G.O.V. (GROSS OBSERVED VOLUME)**  
This is TOV above, (everything in the tank) minus the free water - again at the observed temperature.

Remember - "O" as in observed - not corrected - these are observed volumes regardless of temperature

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Module 5: Gauging & Measurement

**G.S.V. (GROSS STANDARD VOLUME)**  
This is the GOV (from the previous slide) corrected to a standard temperature. In the United States this is 60 degrees F.

**N.S.V. (NET STANDARD VOLUME)**  
This is GSV above minus the Sediment and Water (S&W) - again corrected to a standard temperature.

Remember - "S" means standard - this indicates the volumes have all been corrected or "standardized"

## 5. Gauging & Measurement (page 2)

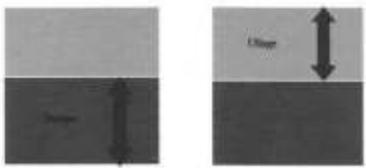
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Module 5: Gauging & Measurement

### T.C.V. TOTAL CALCULATED VOLUME

This is the GSV with the free water added back in. It is therefore all of the product (including S&W) corrected to a standard temperature, with any free water added back in. TCV is primarily a loss control tool as it looks at the complete picture of the cargo on board a vessel.

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### Innage and Ullage



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### Standpipes

Like Sampling - Unslotted standpipes must never be used for gauging. They do not represent what is in the tank. Any difference in internal pressure vs. outside pressure will distort the gauge. Call the office and note protest!

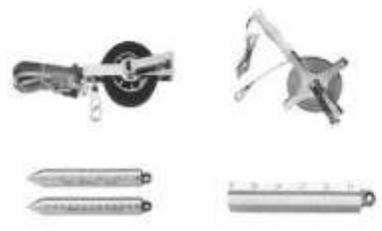
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Module 5: Gauging & Measurement

### GAUGING EQUIPMENT

The most basic form is the manual innage or ullage tape. What is the difference between the two?

Answer: An innage tape's zero point is the tip of the bob. An Ullage tape's is zero at the swivel. If you were doing an ullage with an innage tape you would SUBTRACT the oil on the bob from the Tape in tank. If using an Ullage tape you would ADD the oil on bob to the tape in tank measurement.

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Module 5: Gauging & Measurement

### MMC or HERMETIC

The MMC or HERMETIC tape is a more sophisticated tape. It uses an electronic sensor to detect the oil and water levels and is used for closed-system gauging.



## 5. Gauging & Measurement (page 3)

AmSpec Field Inspector Training Course  
Module 5: Gauging & Measurement

### INNAGE TAPES

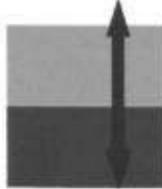
Innage tapes are used to verify the reference height of the tank and to record the depth (innage) of the product in the tank. They can also be used to take ullages.

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Module 5: Gauging & Measurement

### Reference Heights

Always note and record the reference height from the table(s) before gauging – so you will know what to expect.

Always record the observed reference height obtained.



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Module 5: Gauging & Measurement

### Questions

What do you do if you can't reach the reference height?

Normally you would correct the gauge to the reference height difference – effectively doing an innage by ullage.

What about checking for water?

Convert to an ullage ....

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Module 5: Gauging & Measurement

### ACCURACY

API states that – to get a proper gauge you must get 2 identical consecutive gauges or 3 consecutive gauges within 1/8" – only then can a gauge can be considered to be accurate.

This means that you must NEVER EVER take less than two gauges

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Module 5: Gauging & Measurement

### OFFSHORE

You are on a ship that is rolling gently in a 3' - 4' sea. How do you ensure that the gauges are accurate?

API states to take at least 5 gauges in a minimal time – record them, and use the average.

A day later it is pitching all over the place. What do you do then?

API says to take at least 5 – in this case you need to take more until you can be confident that the gauge is representative.

Always record the sea state on the ullage sheet.

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Module 5: Gauging & Measurement

### MORE ACCURACY

Which is generally more accurate, gauging a shore tank or gauging a ship?

A shore tank will generally be more accurate – why?

In a perfect world every ship would be upright, on even keel and in flat calm waters. It rarely works out like that.

This means that every gauge has to be checked and corrected to ensure volumes are as accurate as possible.

## 5. Gauging & Measurement (page 4)

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Module 5: Gauging & Measurement

**QUESTION**

What is the first thing you should do prior to gauging any vessel?

Read the draft marks.

These are there to show the relative position of the ship in the water (ie - whether it is on an even keel or down by the stern or the head).

Draft marks are in either Imperial or Metric units.

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Module 5: Gauging & Measurement

**Exercise**

|    |
|----|
| 38 |
| 37 |
| 36 |

|     |
|-----|
| 880 |
| 840 |

What is the draft?                      What is the draft?

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Module 5: Gauging & Measurement

**IF POSSIBLE**

**IF THE VESSEL IS NOT ON AN EVEN KEEL - Ask the mate if he can move ballast to "level up".**

This is often very easy to do...he can often run a little ballast into the fore peak, or aft peak as required. The 10 minutes it takes to do this is well worthwhile before starting to gauge. No corrections and good water cuts.

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Module 5: Gauging & Measurement

**WHY EVEN KEEL?**

MORE ACCURATE - LESS CORRECTION NEEDED  
LESS CHANCE OF MISTAKES FOR SAME REASON  
WATER DETERMINATION - DO WE TRIM CORRECT WATER? - (NO)

WHAT HAPPENS TO WATER IF "BY THE HEAD" AND GAUGE POINTS ARE AFT?

YOU WILL MOST LIKELY NOT FIND IT

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Module 5: Gauging & Measurement

**TRIM CORRECTIONS**

Trim corrections are made to the observed volume in a tank to bring the volume to the amount it would be on an even keel.

They may be in several forms:

Tabular  
Gauge Corrections

Question: WHEN DON'T YOU NEED TRIM CORRECTION?

Answer...if the gauge point is in the geometric center of the tank (rare) - see over...

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Module 5: Gauging & Measurement

Gauge Point "A" - at forward end of tank - will show LESS cargo if vessel trimmed by the stern (and vice versa).  
Gauge Point "B" - in geometric center of Tank - No Correction Required  
Gauge Point "C" - at forward end of tank - will show MORE cargo if vessel trimmed by the stern (and vice versa).

## 5. Gauging & Measurement (page 5)

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Module 5: Gauging & Measurement

### LIST CORRECTION

**WHAT DOES "LIST" MEAN?**  
Vessel is leaning to one side (not upright)

**HOW CAN YOU TELL IF A VESSEL IS LISTING?**  
Easiest way is to stand in the centerline and LOOK. - Don't trust the Inclinator.

Comparing the midship draft marks is the only accurate way to determine the exact list

**HOW CAN THIS BE CORRECTED?**  
Same thing - Ask the mate to "Level her up" if he can.  
If Not - use the correction tables some more.....

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Module 5: Gauging & Measurement

### CONCERNS

**WATER CONCERNS**  
Gauging for water can never be an exact science, however, care has to be taken when taking water cuts as this is usually "non-soluble" material.

API recommends that when taking water cuts on Heavy Oils the bob be left in place for **AT LEAST 60 Seconds**. Often, significantly longer (5 min) is needed if a good cut is to be achieved.

**Always take Water Cuts - 6 oil/ VOO included !!!!**  
(the only exception is on Asphalt or similar where the water would be STEAM!) (>212 degrees F)  
Take Care.... If the API is <10 the water may be ON TOP!

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Module 5: Gauging & Measurement

### MORE CONCERNS

When the tape is removed from a heated product, the paste is gone.

Always use at least 2 different brands of water paste at first to see which works best and stays on best. You can also try coating the paste with a quick spray of WD40 or similar. (It allows the water get to the paste easier)

The product is a heavy fuel oil, to read the tape you have wash it - which of the following, are not usable?

Water - Of course not!  
Naphtha - Sure (but a little dangerous - Flash point concerns)  
Gasoline - Sure (but a little dangerous also)  
Kerosene - Perfect....  
Acetone - NO! - soaks all the water right back out of the paste!

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Module 5: Gauging & Measurement

### AND MORE CONCERNS

At the tip of the bob there is a clear cut at 1/8", then an area with no change, then 4" of light spotting.

A) Where is the water cut?  
B) What else could you do to verify what you found?  
C) What could help the situation?

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Module 5: Gauging & Measurement

### Answers

A) Where is the water cut?  
Call the solid line BUT also note "Light Spots to 4" - in your tally book

B) What else could you do to verify what you found?  
Take a sample with your zone or better, a thief so you can see what it looks like

C) What could help the situation?  
As discussed, try different pastes, spray the paste with WD-40 etc. There is most likely an oil/water emulsion down there

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Module 5: Gauging & Measurement

### EXAMPLES

You get a 2" water cut, the paste is scratched and "gritty" - why?  
Most likely you have "water saturated sediment"

Do you use water paste on the ROH survey?  
YES - If you do call it water on the open - be consistent on the close. You can't call it water on the open then call it sediment on the close. If it looks the same - call it the same.....

## 5. Gauging & Measurement (page 6)

AmSpec Field Inspector Training Course  
Module 5: Gauging & Measurement

### PRODUCT PASTES

These are used to determine the cut for clear refined products.

Several different brands

NEVER use Chalk or talcum powder !!!  
False readings will occur due to the liquid "Creeping" up the powder

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Module 5: Gauging & Measurement

### REFERENCE HEIGHTS

When gauging a tank we have to verify the reference height - why?  
To make sure you reach the bottom and check for flexing. What would you do if the reference height is not found or if an obstruction is in the way?  
Image By Ullage - BE CAREFULL with water etc...  
The gauged height is 26'. This shows a water cut of 2" but the reference height is 27'.  
You have 1' 2" (14") of water in there....  
How do you report the water? - REPORT WHAT YOU SAW IN YOUR BOOK - ALWAYS

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Module 5: Gauging & Measurement

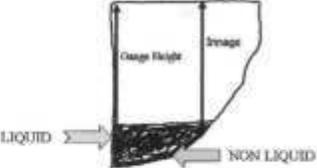
### SLOP TANKS

GAUGE HEIGHT IS 45'00" - YOU GET A HEIGHT OF 40' BEFORE YOU HIT THE SHIP'S SIDE - YOU GET 0.005 (1/2 oz) SEDIMENT

HOW DO YOU CALCULATE THIS?  
A Tough call -- but lets get practical... Most likely you are hitting the inside side (see next slide) and picking up some sediment. Remember the slop tanks normally go to a virtual "Point" so - either way we are not looking at a large volume. Now...If its liquid however...you need to do image by ullage...

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Module 5: Gauging & Measurement

### Slop Tank OBQ/ROB Gauging



The diagram shows a cross-section of a slop tank. A vertical line on the left is labeled 'Gauge Height'. A vertical line on the right is labeled 'Image'. The bottom of the tank is divided into two regions: 'LIQUID' on the left and 'NON LIQUID' on the right. Arrows point from the labels 'LIQUID' and 'NON LIQUID' to their respective regions.

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Module 5: Gauging & Measurement

### Critical Zones

The vertical section of a shore tank identified on the capacity table where the floating roof is only partially afloat and the table may be inaccurate.

In other words the roof is neither fully afloat, nor fully resting on the legs.

Check that you are using the right table for the leg position. Shore Tanks often have 2 sets of strapping tables, one set for low legs and one set for high legs.

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Module 5: Gauging & Measurement

### When a roof is in the Critical Zone

It is not permissible to "interpolate". The number will not be correct.

The only correct way to deal with a roof in the critical zone is to transfer into or out of it until it is clear of the zone, either fully afloat, or fully on its legs

## 5. Gauging & Measurement (page 7)

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Module 5: Gauging & Measurement

### Three Cardinal rules for Critical Zones

Call the Office  
Call the Office  
Call the Office

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Module 5: Gauging & Measurement

### Inspectors with foresight

Check that a roof will not be in the critical zone on the completion of a movement - this is proactive.

Take a few minutes to check that this is not going to happen, before the job starts.

If you suspect it might - go ahead and make your phone call!

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Module 5: Gauging & Measurement

### GAUGING SAFETY

READ the MSDS before doing anything.

Never assume that a product is harmless.

Wear your personal gas monitor at all times.

Discharge static by touching the tank with a bare hand.

Stand up-wind of the hatch.

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Module 5: Gauging & Measurement

### MORE SAFETY

NEVER open any hatches, valves or operate any equipment yourself.

Ensure that the Inert Gas system is off before a hatch is opened.

Wear whatever protective clothing is called for.

Remember that leather shoes - so when working with chemicals wear rubber boots.

If the tape "Run away" ~~Do Not~~ try to stop it with your hand.

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Module 5: Gauging & Measurement

### PLEASE

Don't stick your head over the hatch to see what is inside.

Don't rely on your sense of smell to detect fumes, or chemicals. Some chemicals deaden the sense of smell instantly - can you name one?????

# H2S

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Module 5: Gauging & Measurement

### On some ships

You may have to keep one step ahead of the Mate. You may hear the words "trust me on this".

NEVER do this! You must back everything up with your own observations and be prepared to stand behind your work.

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## 6. ROB & OBQ (page 1)

AmSpec Field Inspector Training Course  
Module 6: ROB/OBQ

**ROB & OBQ**

AmSpec Field Inspector Training Course  
Module 6: ROB/OBQ

**ROB/OBQ is also covered in**

API Chapters 17.1 and 17.4

Some of the test required after study of this section refers to these standards

It is recommended that these standards be reviewed in conjunction with viewing this course, before taking the written test

AmSpec Field Inspector Training Course  
Module 6: ROB/OBQ

R.O.B. AND O.B.Q. SURVEYS ARE BASICALLY THE SAME - OBQ BEFORE A LOADING AND OF COURSE ROB AFTER A DISCHARGE.

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Module 6: ROB/OBQ

**IN THIS SECTION, WE WILL DISCUSS:**

- VISUAL TANK INSPECTIONS
- BUNKER SURVEYS
- VOID/ BALLAST SPACE CHECKS
- SEA VALVES
- THE OBQ/ROB INSPECTION
- PIPELINE CONDITION
- DROPPING/ DRAINING LINES

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Module 6: ROB/OBQ

**VISUAL TANK INSPECTIONS**

MOSTLY DONE ON CHEMICAL/ CLEAN PRODUCT VESSELS.

RULES FOR "ENTRY TO CONFINED SPACES" APPLY.

FOLLOW ALL NECESSARY PRECAUTIONS

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Module 6: ROB/OBQ

**Wall Wash Procedure**

Again – Confined space entry precautions are a must.

Never Wall wash with dangerous cargo.

Usually Methanol and occasionally Acetone are used. If you are asked to use anything else you must get clearance from your office before proceeding

## 6. ROB & OBQ (page 2)

AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**BUNKER SURVEYS**

TO DETERMINE IF THE VESSEL HAS USED  
THE CORRECT AMOUNT OF BUNKERS

AND THAT THE BUNKERS ARE INDEED THAT  
... BUNKERS

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Module 6: ROB/OBQ

**CHEMICAL TANKERS:**

OFTEN HAVE COATED TANKS:  
POLYURETHANE  
EPOXY  
ZINC SILICATE  
CLAD WITH STAINLESS STEEL

HOW DO YOU KNOW THAT THE CARGO WILL  
NOT REACT WITH THE COATING?  
Ask to see the vessel's coating manual.....

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Module 6: ROB/OBQ

**LAST THREE CARGOES**

WHY DO WE ASK WHAT THE LAST THREE  
CARGOES WERE IN A TANK?

We need to check that the previous cargoes are  
compatible to the nominated cargo re: safety and  
potential contamination

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Module 6: ROB/OBQ

**VOID/BALLAST SPACE CHECKS**

WHY DO THIS?  
To ensure they are not full and are not  
contaminated with oil

WHAT SHIP TYPES ARE THE WORST FOR THIS?  
OBO type carriers – they have many, many  
spaces, and are prone to cracks.

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Module 6: ROB/OBQ

**TYPES OF VOID/BALLAST SPACES  
INVOLVED**

COFFERDAMS, DOUBLE BOTTOMS, STOOL  
SPACE, DEEP TANKS, PEAK TANKS, BILGES,  
PUMPROOM, ENGINE ROOM, HOLDS, PIPE  
TUNNELS, HOPPER TANKS, UPPER WING  
BALLAST TANKS, PIPE DUCTS

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Module 6: ROB/OBQ

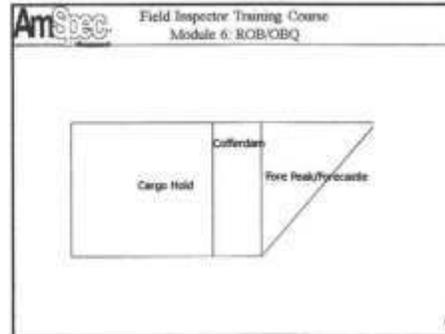
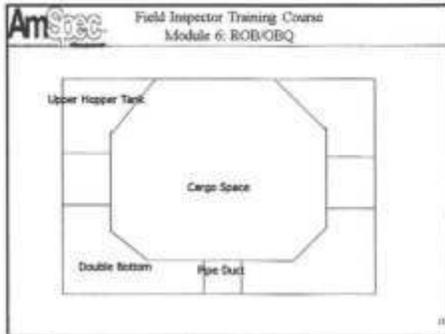
**FACT:**

BECAUSE SHIPS HAVE SO MANY (OFTEN HARD TO  
CHECK) SPACES YOU MUST ...MUST ...MUST... DO A  
SHIP TO SHORE COMPARISON (AT LEAST OF T.C.V),  
BEFORE THE SHIP LEAVES.

YOU MUST ALSO IMMEDIATELY REPORT ANY  
DISCREPANCIES TO YOUR OFFICE

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## 6. ROB & OBQ (page 3)



AmSpec Field Inspector Training Course  
Module 6: ROB/OBQ

### Sea Valves

You need to ensure that Sea Valves are sealed from Loadport. If You are the Loadport – Seal 'em up.

Seal the valve from the wheel DOWNWARDS so that no-one can remove the wheel and simply open the valve with a wrench

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Module 6: ROB/OBQ

### NEVER...NEVER...NEVER

OPERATE ANY VALVE, SWITCH, OR OTHER MACHINERY ON A VESSEL, OR ASHORE.

A physical check of the seal and wire is required however.

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Module 6: ROB/OBQ

### ROB INSPECTIONS

READ THE DRAFTS  
BOARD THE VESSEL  
PAPERWORK READY... AS MUCH AS POSSIBLE SHOULD BE DONE BEFORE LEAVING THE VESSEL ON THE ARRIVAL SURVEY

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Module 6: ROB/OBQ

### SOME DO'S AND DON'TS

Don't just arrive on board for an ROB survey with just a tape...  
YOU NEED EVERYTHING YOU BROUGHT TO THE ARRIVAL SURVEY  
Tape – Probe – Water Paste – Sample Bottles - -  
Everything  
BE PREPARED

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## 6. ROB & OBQ (page 4)

AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

### STRIPPING PIPELINES

THE ONLY WAY TO VERIFY THAT THE VESSEL STRIPPED OUT THE BOTTOM LINES PROPERLY IS TO WATCH THEM DO IT.  
ARRIVE EARLY AND WATCH THEM DO IT. MOST VESSELS WILL BE DELIGHTED TO EXPLAIN WHAT THEY ARE DOING. PUT IT IN YOUR TIME LOG.  
CRUDE SHIPS WILL NORMALLY USE A SMALL STRIPPING PUMP TO STRIP THE LINES, UP TO THE MANIFOLD VIA THE SMALL DIAMETER "MARKOL" LINE.  
THIS LINE IS EASY TO IDENTIFY. IT WILL BE ABOUT A 4" LINE, AND WILL JOIN THE MANIFOLD OUTBOARD OF THE MAIN MANIFOLD VALVES.

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Module 6: ROB/OBQ

### PIPELINE CAPACITIES

If a vessel has 30" main bottom lines with a total combined length of 2,000 FEET

The line volume would amount to 1,750 BBls @ \$80 per barrel.....\$140,000 !

It is important to check

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Module 6: ROB/OBQ

### DECK LINES

THESE ARE EASIER TO CHECK USING THE TAP TEST.

Do they ring empty.....  
OPENING THE VALVES TO A SINGLE AFT TANK (DONE BY SHIP'S STAFF)  
Gauge the tank before AND After dropping the lines

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Module 6: ROB/OBQ

### TYPES OF ROB INSPECTION

DEPENDS ON THE VESSEL AND THE CARGO

DEPENDS ON THE POSITION OF THE GAUGE HATCH.

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Module 6: ROB/OBQ

### VISUAL

SOMETIMES IT'S POSSIBLE TO SIMPLY LOOK INTO THE TANK AFTER DISCHARGE - SAY ON LIGHT LUBE OIL, VEG OIL, OR NON-HAZARDOUS CHEMICAL CARGOES, SUCH AS GLYCERINE.

AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

### MORE OFTEN, HOWEVER...

WE MUST WORK "BLIND" - THE TANKS CANNOT BE OPENED TO ALLOW US TO DIRECTLY SEE THE BOTTOM, EITHER BECAUSE OF INERT GAS, OR DUE TO THE HAZARDOUS NATURE OF THE CARGO.

WE MUST THEREFORE USE THE CORRECT GAUGING EQUIPMENT.

## 6. ROB & OBQ (page 5)

**AmSpec** Field Inspector Training Course  
Module 6: ROB/OBQ

**"MMC" TYPE SHIPS OFTEN HAVE ONLY A SINGLE GAUGE POINT**

A POTENTIAL PROBLEM IF HIGH POUR CARGOES ARE ABOARD AND GAUGE POINT IS NOT AT THE AFT END OF THE TANK.

WHAT TYPE OF MMC / HERMETIC EQUIPMENT SHOULD BE USED FOR THE ROB SURVEY?  
Use the brass hob type – Not the delicate sensor head!

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Module 6: ROB/OBQ

**THE LIQUID OR NON-LIQUID QUESTION**

We need to determine if the ROB is liquid or non liquid  
Sometimes this is easy to do, sometimes not  
IF IN DOUBT...GET A SAMPLE!  
MULTI-POINT GAUGING CAN HELP TO DETERMINE LIQUID OR NON-LIQUID?  
If the ROB is even over the bottom its likely to be non liquid  
CAN YOU HAVE BOTH LIQUID AND NON-LIQUID IN THE SAME TANK?  
Of Course – Likelihood is that you will often have this

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**AmSpec** Field Inspector Training Course  
Module 6: ROB/OBQ

**PUMPABILITY**

THE INSPECTOR SHOULD NOT NORMALLY CALL ROB OR OBQ "PUMPABLE" OR "UNPUMPABLE".

PUMPABILITY DEPENDS NOT ONLY ON THE NATURE OF THE MATERIAL, BUT ALSO ON SHIP'S CAPABILITY, OF WHICH THE INSPECTOR CANNOT BE CERTAIN, NOT USUALLY HAVING BEEN A CHIEF MATH HIMSELF.

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Module 6: ROB/OBQ

**CALL IT AS YOU SEE IT!**

CALL THE OFFICE IF SOMEONE DEMANDS A "PUMPABILITY" DETERMINATION!

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**AmSpec** Field Inspector Training Course  
Module 6: ROB/OBQ

**TEMPERATURES:**

IF YOU FIND A SUFFICIENT VOLUME OF LIQUID R.O.B. GET A TEMPERATURE AND USE IT TO CALCULATE THE GSV VOLUME (USE ULLAGE SHEET ATTACHED TO THE OBQ/ROB FORM.

FOR NON-LIQUID ROB OR SMALL LIQUID QUANTITIES USE 60 DEG F.

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**AmSpec** Field Inspector Training Course  
Module 6: ROB/OBQ

**SOME PROBLEMS - WHAT CAN BE DONE?**

CANNOT REACH BOTTOM DUE TO "SLUDGE" OR WAX  
TOO THICK TO GET A SAMPLE  
ONLY ONE GAUGE POINT  
CARGO IS "SET-UP" IN A WEDGE

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## 6. ROB & OBQ (page 6)

AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**EXAMPLE:**

THE FOLLOWING GAUGES ARE OBTAINED - WHAT DO YOU USE TO CALCULATE THE VOLUME?

|        |        |
|--------|--------|
| 3.5cms | 6.0cms |
| 6.5cms |        |
| 4.0cms | 5.0cms |

Note - All gauges are Non-liquid and the bottom was flat

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Module 6: ROB/OBQ

**ANSWER:**

For Non-Liquid ROB the rule is to **AVERAGE** the innages and call it "Across the Bottom" straight from the strapping tables.  
No Trim Correction applied  
No Wedge tables or formula to be used.  
In this case it would be 5.0cms

AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**WHAT IF THE 6.5 CMS IN THE CENTER OF THE TANK WAS LIQUID?**

**WOULD THIS CHANGE YOUR THINKING?**  
Not really - it's probably an isolated puddle in a sea of sediments -  
4 gauges out of 5 say its non-liquid, so go with that

AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**GAUGE HEIGHTS**

NO PROBLEM IF AT THE GAUGE HATCH - THE GAUGE HEIGHT IS IN THE TABLES.

WHAT ABOUT IF YOU ARE MULTI POINT GAUGING AT SAY A "BUTTERWORTH" HATCH  
-HOW DO YOU KNOW WHAT THE GAUGE HEIGHT SHOULD BE THERE?

The thing to do is measure from the steps plane - or measure the steady height and adjust for the hatch height - its not an exact science.

Best Plan is to use the 18" bar and make sure you get to the bottom if not at an official Gauging point.

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Module 6: ROB/OBQ

**GIVEN THE FOLLOWING INFO...**

**WHAT WOULD YOU USE AS AN INNAOE?**

GAUGE HEIGHT FROM TABLE = 22.05m  
GAUGE HEIGHT OBTAINED = 21.92m  
WAX ON ROB = 5 cm

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Module 6: ROB/OBQ

**Think About it -- Draw a picture if it helps you**

Its basically an "Image by Ullage situation  
You have 5cm of wax on the bob  
And you are 13 cm short of the reference height.  
Amount of wax is 5cm PLUS 13 cm = 18cm.  
GET A SAMPLE - The Wax is likely to be solidified cargo - NOT just unworkable sediment  
Keep good records and put a comment on the ROB like "ROB appears to be cargo below its pour point - Sample retained at office"  
PROTEST the vessel for the same thing

## 6. ROB & OBQ (page 7)

AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**A More Complicated Example**

|         |         |           |
|---------|---------|-----------|
| 30ms NL | 30ms NL | 12 cms LQ |
| 40ms NL | 30ms NL |           |
| 50ms NL | 30ms NL | 110ms LQ  |

FRD AFT

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Module 6: ROB/OBQ

**Visual Representation**

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Module 6: ROB/OBQ

**SUGGESTED APPROACH**

AVERAGE MY NON-LIQUID GAUGES ie  
 $(3+3+4+4+5)/5=3.66$

USE THIS "ACROSS THE BOTTOM" (TOTAL NON LIQUID)

AVERAGE THE LIQUID GAUGES ie  $(12+11)/2=11.5$

SUBTRACT THE 3.66 FROM THE 11.5 = 7.84

WEDGE THE 7.84 (FOR THE TOTAL LIQUID)

Make two entries for the tank on my ROB Form  
One for the non- Liquid, and one for the Liquid

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AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**KEEP NOTES IN YOUR BOOK OF WHAT YOU DID**

IN CASE YOU HAVE TO JUSTIFY THE METHOD YOU USED AT A LATER TIME.

IT'S HARD TO ARGUE AGAINST SIMPLE LOGIC LATER IF IN DOUBT...CALL!

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AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**WEDGE CALCULATIONS**

QUITE ACCURATE FOR SQUARE TANKS

INACCURATE FOR TANKS SUCH AS 1 WINGS AND SLOP WINGS

PRODUCT MUST NOT TOUCH FORWARD BULKHEAD

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AmSec Field Inspector Training Course  
Module 6: ROB/OBQ

**WEDGE TABLES**

WEDGE TABLES ARE BECOMING MUCH MORE COMMON ABOARD SHIPS NOW ... BUT!

IF YOU ARE GOING TO USE WEDGE TABLES, YOU SHOULD VERIFY THAT THEY ARE OFFICIAL, AND NOT JUST "PREPARED BY THE SHIP" (WHY!!)

IF YOU ARE UNSURE, CHECK THEM AGAINST THE WEDGE FORMULA

THEY SHOULD BE REALLY CLOSE

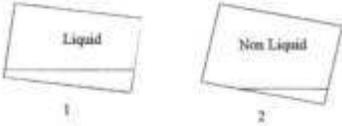
32

## 6. ROB & OBQ (page 8)

AmSpec Field Inspector Training Course  
Module 6: ROB/OBQ

### ROB EXAMPLES

How would you calculate these?



1 2

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Module 6: ROB/OBQ

### BALLAST TANKS

SEVERAL TYPES OF BALLAST TANKS:  
DEDICATED BALLAST TANKS  
PERMANENT BALLAST TANKS  
DESIGNATED CLEAN BALLAST TANKS  
DESIGNATED DIRTY BALLAST TANKS

THEY ALL HAVE THE SAME FUNCTION – TO REPLACE CARGO AS IT IS DISCHARGED, TO TRIM THE SHEEP AND TO ENSURE THE VESSEL'S STABILITY AND MANEUVERABILITY.

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Module 6: ROB/OBQ

### DEDICATED BALLAST TANK

A SPACE THAT CAN BE USED FOR EITHER CARGO OR CLEAN BALLAST, BUT NOT BOTH. NO INTER-CONNECTING VALVES TO THE CARGO SYSTEM. POSITIVE SEPARATION BY BLDN'GS, OR EQUIVALENT METHODS.

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AmSpec Field Inspector Training Course  
Module 6: ROB/OBQ

### PERMANENT BALLAST TANKS:

EXAMPLES ARE DOUBLE BOTTOMS, PEAK TANKS ETC. – NOT DESIGNED FOR ANYTHING OTHER THAN BALLAST WATER (FRESH OR SALT). NO CONNECTIONS TO CARGO SYSTEM PERMITTED.

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Module 6: ROB/OBQ

### DESIGNATED CLEAN BALLAST TANK

A CARGO TANK THAT HAS BEEN CLEANED FOR THE CARRIAGE OF BALLAST WATER. NO OIL ON WATER SHOWING.

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Module 6: ROB/OBQ

### DESIGNATED DIRTY BALLAST TANKS

TANKS THAT ARE BALLASTED AFTER BEING STRIPPED OF CARGO, USUALLY ONLY USED AS A LAST RESORT WHEN THE VESSEL HAS INSUFFICIENT CLEAN BALLAST CAPACITY TO MEET AIR DRAFT RESTRICTIONS ETC.

DIRTY BALLAST TANKS ARE DIRECTLY CONNECTED TO THE CARGO SYSTEM AND THIS IS WHY VESSELS ARE NOT ALLOWED TO TAKE SUCH BALLAST WHILE MOVING CARGO. TRANSFERS MUST BE COMPLETED OR INTERRUPTED PRIOR TO SUCH BALLAST OPERATIONS.

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## 6. ROB & OBQ (page 9)

**AmSpec** Field Inspector Training Course  
Module 6: ROB/OBQ

**OIL ON BALLAST SPACE WATER**

THE ONLY TIME THAT YOU WILL HAVE THIS IN THE CASE OF DIRTY BALLAST TANKS.

IF IT OCCURS ON ANY OTHER BALLAST OR VOID SPACE IT IS CONSIDERED BY DEFINITION TO BE "OIL IN A NON DESIGNATED SPACE" - (DISCUSSED LATER)

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**AmSpec** Field Inspector Training Course  
Module 6: ROB/OBQ

**If you find oil where it isn't supposed to be**

Measure it and sample it if you can  
Call the office  
Issue a protest to the vessel  
Record as much information as you can, including documentation of any delays caused by this.

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**AmSpec** Field Inspector Training Course  
Module 6: ROB/OBQ

ANY QUESTIONS?

GOOD

HERE ARE SOME FOR YOU

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## 7. Line Verification (page 1)

AmSpec Field Inspector Training Course  
Module 7: Line Verification

### Line Verification

AmSpec Field Inspector Training Course  
Module 7: Line Verification

Line Verification is also covered in

API Chapters 17.6

Some of the test required after study of this section refers to this standard

It is recommended that this standard be reviewed in conjunction with viewing this course, before taking the written test

AmSpec Field Inspector Training Course  
Module 7: Line Verification

Some form of Line Verification Should Always be Done

Refusal to do a verification should result in a Letter of Protest

Record the name of the person refusing to do the verification

Call the office. (Who will then advise the clients)

NOTE: It is NOT permitted to simply state "foist to be full by the dockman!"

AmSpec Field Inspector Training Course  
Module 7: Line Verification

THERE ARE ONLY THREE POSSIBLE SITUATIONS FOR ALL PIPELINES AND THREE MEANS OF VERIFICATION

FULL OF PRODUCT  
PARTIALLY FULL OF PRODUCT  
EMPTY OF PRODUCT

DISPLACE ANY AIR OR VAPOR WITH LIQUID  
CLEAR (EMPTY) THE ENTIRE LINE CONTENTS OF LIQUID  
QUANTIFY ANY AIR OR VAPOR TRAPPED INSIDE THE PIPELINE

AmSpec Field Inspector Training Course  
Module 7: Line Verification

API CHAPTER 17.6 RECOMMENDS

FIVE METHODS OF VERIFYING FULLNESS:

- INTERNAL CIRCULATION METHOD
- LINE DISPLACEMENT METHOD
- HIGH POINT BLEED VALVE OR SIGHT GLASS METHOD
- PIGGING THE LINE METHOD
- LINE PACK / LINE PRESS METHOD

AmSpec Field Inspector Training Course  
Module 7: Line Verification

ALL METHODS OTHER THAN LINE DISPLACEMENT CAN BE DONE BEFORE THE TRANSFER STARTS...

This is an advantage because it means that the line fullness can be proved BEFORE any custody transfer is started. This can save any arguments later

## 7. Line Verification (page 2)

AmSpec Field Inspector Training Course  
Module 7: Line Verification

**API DOES NOT**

GIVE AN "ACCEPTABLE DIFFERENCE" WHEN DETERMINING LINE FULLNESS...

THEY STATE THAT CONCERNED PARTIES SHOULD MAKE THIS DETERMINATION PART OF THE CONTRACT.

THIS IS KNOWN AS THE "AGREED TOLERANCE"... IT IS NOT UP TO US TO DECIDE WHAT THIS IS.

6

AmSpec Field Inspector Training Course  
Module 7: Line Verification

**PER THE STANDARD:  
THE TERMINAL'S RESPONSIBILITY IS TO**

SELECT A METHOD AND TO HAVE EVIDENCE ON HAND TO DEMONSTRATE THE EFFECTIVENESS OF THE METHOD SELECTED

**OUR RESPONSIBILITY IS**

TO PROTEST DISCREPANCIES THAT MIGHT AFFECT THE TRANSFERRED QUANTITIES

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AmSpec Field Inspector Training Course  
Module 7: Line Verification

**THE VESSEL'S RESPONSIBILITY IS**

TO PROVIDE PIPELINE VOLUMES

TO INDICATE TO US IF THEY ARE FULL OR EMPTY.

TO PROVIDE EVERY ASSISTANCE TO DETERMINE THIS CONDITION.

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AmSpec Field Inspector Training Course  
Module 7: Line Verification

**INFORMATION TO BE NOTED BY THE INSPECTOR**

THE CAPACITY/CONDITION OF THE DESIGNATED PIPELINES

THE DATE & TIME OF THE LAST MOVEMENT THROUGH THE PIPELINES

THE CARGO TEMPERATURES

THE VERIFICATION METHOD TO BE USED

THIS IS GENERALLY DONE AT THE KEY MEETING

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AmSpec Field Inspector Training Course  
Module 7: Line Verification

**ALWAYS NOTE**

SHORE TANKS THAT ARE, OR WILL BE, IN THE CRITICAL ZONE SHOULD NOT BE USED FOR LINE VERIFICATIONS

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AmSpec Field Inspector Training Course  
Module 7: Line Verification

**INTERNAL CIRCULATION METHOD**

PRODUCT IS CIRCULATED BETWEEN TWO SHORE TANKS

THROUGH THE DESIGNATED PIPELINE(S) INCLUDING THE DOCK MANIFOLD IF POSSIBLE, AND...

MUST TAKE PLACE IMMEDIATELY BEFORE AND/OR AFTER CUSTODY TRANSFER

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## 7. Line Verification (page 3)

**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

### PROCEDURE

1. GAUGE THE DELIVERY AND RECEIVING TANKS. RELIABLE AUTOMATICS OR MANUAL GAUGES ARE ACCEPTABLE.
2. CIRCULATE AT LEAST 120% OF THE COMBINED LINE VOLUMES.
3. RECORD AND COMPARE THE T.O.V. VOLUMES. IF OVER THE "AGREED TOLERANCE" - REPEAT THE OPERATION. IF THE DIFFERENCE PERSISTS, THE INTEGRITY OF THE SYSTEM MUST BE CHECKED.
4. IF THE DIFFERENCE IS WITHIN THE AGREED TOLERANCE - THE PIPELINE IS NOW CONSIDERED FULL.

11

**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

### LINE DISPLACEMENT METHOD

IS ONLY DONE AFTER A FULL VESSEL INSPECTION

IDEALLY, THE VESSEL SHOULD BE ON EVEN KEEL - OTHERWISE APPLY APPROPRIATE CORRECTIONS.

THE VESSEL SHOULD NOMINATE THE MINIMUM NUMBER OF TANKS THAT CREATES MINIMUM TRIM OR LIST CHANGES.

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

### VESSEL PIPELINES

INCLUDING DECK LINES, RISERS, AND BOTTOM LINES SHOULD BE IN THE SAME FILL CONDITION BEFORE AND AFTER TRANSFER. IF NOT, THE SLACK VOLUME WILL HAVE TO BE CONSIDERED IN THE COMPARISON.

TRANSFER SHOULD BE AT LEAST 120% OF COMBINED VESSEL AND SHORE PIPELINE VOLUMES.

AGAIN - NOTE THE DIFFERENCE DO NOT APPLY IT

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

### STEPS

1. GAUGE/TEMPERATURE SHIP & SHORE TANKS.
2. TRANSFER THE VOLUME (120%), RE-GAUGE
3. RECORD AND COMPARE VOLUMES (T.O.V.)

IF THE DIFFERENCE IS OVER THE AGREED TOLERANCE YOU SHOULD ALWAYS CALL THE OFFICE FOR GUIDANCE.

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

### OPTIONS FOR DEALING WITH DISCREPENCIES

RE-CALCULATE ALL FIGURES  
RE-GAUGE DESIGNATED SHORE AND VESSEL TANKS  
RE-GAUGE ALL VESSEL TANKS  
REPEAT THE PROCEDURE  
PROCEED WITH TRANSFER (only with direct authorization from your office)

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

### HIGH POINT BLEED VALVE/ SIGHT GLASS METHOD

THESE VALVES / GLASSES ARE PURPOSE-BUILT. IT IS NOT PERMISSIBLE TO JUST USE ANY VALVES FOR THIS PURPOSE - ONLY VALVES THAT HAVE BEEN SPECIALLY INSTALLED FOR THIS JOB.

THEY ARE INSTALLED AT THE HIGH POINTS ON A PIPELINE SUCH AS ROAD CROSSINGS, OR OTHER ELEVATED SECTIONS.

THIS METHOD MAY NOT BE USED WHERE PIPELINES HAVE LONG HORIZONTAL SECTIONS.

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## 7. Line Verification (page 4)

**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

**METHOD**

VALVES ARE OPENED (BY TERMINAL PERSONNEL ONLY) AND THE PIPELINE IS PLACED UNDER POSITIVE PRESSURE

CHECKS ARE MADE FOR AIR OR VAPOR IN THE LINE - ALLOW THE AIR / VAPOR TO BLEED OFF

REPEAT AT EACH DESIGNATED POINT

PROVISION MUST BE MADE TO AVOID SPILLAGE

WHEN ONLY LIQUID IS SEEN AT ALL POINTS THE LINE IS CONSIDERED TO BE FULL.

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

**PIGGING THE LINE METHOD**

THE TERMINAL MUST HAVE SPECIAL EQUIPMENT INCLUDING A LAUNCHER, RECOVERY SYSTEM AND THE PIG.

THE PIG IS A TIGHT FITTING WIPING DEVICE THAT IS PROPELLED THROUGH THE LINE BY LIQUID, GAS, OR COMPRESSED AIR

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

**THIS METHOD PHYSICALLY DISPLACES**

THE ENTIRE LINE CONTENTS, REPLACING THE ORIGINAL CONTENTS.

IN THE CASE OF EMPTY BEFORE, FULL AFTER, OR VICE VERSA, THE LINE CAPACITY MUST BE ACCOUNTED FOR IN THE CUSTODY TRANSFER CALCULATION

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

**LINE PACK/ LINE PRESS METHOD**

1. THE DOCK VALVE IS CLOSED (BY TERMINAL PERSONNEL) AND THE SYSTEM IS LINED UP
2. THE TANK(S) ARE MEASURED (RELIABLE AUTOMATIC OR MANUAL)
3. THE PUMP IS STARTED AND RUN UNTIL THE PRESSURE STABILIZES OR REACHES THE PREDETERMINED FIGURE
- 3 VALVES ARE CLOSED TO ISOLATE THE SYSTEM
- 4 THE TANK IS RE-GAUGED USING THE SAME METHOD AND EQUIPMENT.
- 5 IF WITHIN  $1/8"$  or  $(0.006)$  PIPELINES ARE NOW CONSIDERED FULL.

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**AmSpec** Field Inspector Training Course  
Module 7: Line Verification

**ANY QUESTIONS?**

**GOOD**

**HERE ARE SOME FOR YOU**

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## 8. Calculations & Reporting (page 1)

AmSpec Field Inspector Training Course  
Module 8: Calculations/Reporting

### Calculations/Reporting

1

AmSpec Field Inspector Training Course  
Module 8: Calculations/Reporting

### Calculations are also covered in

API Chapters 11 and 12

Some of the test required after study of this section refers to these standards

It is recommended that these standards be reviewed in conjunction with viewing this course, before taking the written test

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AmSpec Field Inspector Training Course  
Module 8: Calculations/Reporting

### STANDARDIZATION

Inspection is an international business. There is obviously a need to have a uniform system of measurement so that we, and through us the buyers and sellers can compare "apples to apples"

There are still differences out there however, for example Centigrade and Fahrenheit, feet and meters etc. and we must therefore use standard conversion factors to move between the various units

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AmSpec Field Inspector Training Course  
Module 8: Calculations/Reporting

### HISTORY

Until 1974, "Old" Table 6 and "Old" Table 54 were used by both importers and exporters for just about any cargo - products as well as crude oil.

In 1984, more accurate tables were introduced  
Developed by the API (American Petroleum Institute) jointly with the I.P. (Institute of Petroleum)

These are 6A, 6B, 6C, 6D and 54A, 54B, 54C and 54D

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AmSpec Field Inspector Training Course  
Module 8: Calculations/Reporting

### HISTORY (Cont'd)

In 2006 further changes were made:

The API once again introduced new tables.  
Went to 5 decimal places for VCF  
Tables every 0.1 gravity and 0.5 Temperature  
If the old table was approximately 300 pages - the new would need to be 11,000 pages or so  
Needs to be done electronically

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AmSpec Field Inspector Training Course  
Module 8: Calculations/Reporting

### Table Usage

A is used for CRUDE oils  
B is used for PRODUCTS (2oil, 6oil etc.)  
C is used for CHEMICALS  
D is used for LUBE OILS

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## 8. Calculations & Reporting (page 2)

AmStar Field Inspector Training Course  
Module 8: Calculations/Reporting

### COMPARISON OF TABLES

Tables 54A / 6A and 54B/6B are really the same tables

Tables 6A and 6B are based on Fahrenheit temperatures and API gravity whereas Tables 54A and 54B are based on Centigrade temperatures and Density

Any difference is due to "rounding" of temperature or density

Note however that the "old" Table 6 and 54 are not equivalent to the new 6A and 54A

AmStar Field Inspector Training Course  
Module 8: Calculations/Reporting

### SUMMARY

As long as the bill of lading is issued based on the new tables, either 6A or 54A etc, there is no real need to rework the figures

Some places will do use the old tables however, and in such cases you should collect as much information as you can so that the SOL and load figures can be reworked, so we are comparing those "Apples to Apples".

AmStar Field Inspector Training Course  
Module 8: Calculations/Reporting

### SPECIAL CASES

Chemicals such as Xylene can be calculated in several ways - Table 1555, Table 6C, or even using specific client's proprietary tables

If you are working a cargo such as this, should the loadport have used a different method, you need to agree recalculate

Round the old, the new, and WHY you did this - remember you are not there to just gather information

Remember to always collect as much loadport paperwork as possible

AmStar Field Inspector Training Course  
Module 8: Calculations/Reporting

### Barrels and Gallons etc

The basic units of measurement here in the States are the U.S. Barrel, and the U.S. Gallon. There are 42 U.S. Gallons in a Barrel - By definition.

In Europe, the base unit of volume is the Cubic Meter. There are 6.28981 barrels in a cubic meter. Most calculations take the observed cubic Meter volume and multiply this figure by a factor (the observed density at that temperature) to come up with Metric Tons.

AmStar Field Inspector Training Course  
Module 8: Calculations/Reporting

### THE METRIC SYSTEM

Except for the US, most of the world is now using the metric system. While there are some exceptions, the fact is that most ships, and exporting countries will report figures in Cubic Meters and Metric tons. The Metric system is in fact much easier to use than the "old" system. There are several standard terms:

Cent - means hundredth (as in centimeter)

Milli - means thousandth (as in millimeter)

Kilo - means thousand (as in kilogram or kilometer)

AmStar Field Inspector Training Course  
Module 8: Calculations/Reporting

### Metric Volumes, Lengths and Weights

One very nice thing about the metric system is the way that lengths relate directly to volumes. A cubic meter is exactly that - the volume of a cube 1m high x 1m wide x 1m deep.

If you divide a cubic meter by 1000 you get the base unit of volume for the metric system - the liter. By definition 1000 liters = 1 cubic meter

NOW, since the density of water at 15 degrees C = 1.00000 what does 1 cubic meter of water weigh?

1 METRIC TONNE (remember, weight = Volume x Density)

## 8. Calculations & Reporting (page 3)

 Field Inspector Training Course  
Module 8: Calculations/Reporting

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Note however that the "old" Table 6 and 54 are not equivalent to the new 6A and 54A

 Field Inspector Training Course  
Module 8: Calculations/Reporting

### SUMMARY

As long as the bill of lading is issued based on the new tables, either 6A or 54A etc. there is no real need to rework the figures.

Some places still do use the old tables however, and in such cases you should collect as much information as you can so that the BCF and load figures can be reworked, so we are comparing these "Apples to Apples".

 Field Inspector Training Course  
Module 8: Calculations/Reporting

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Record the old, the new, and WHY you did this - remember you are not there to just gather information

Remember to always collect as much loadport paperwork as possible

 Field Inspector Training Course  
Module 8: Calculations/Reporting

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 Field Inspector Training Course  
Module 8: Calculations/Reporting

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*Cent* - means hundredth (as in centimeter)  
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 Field Inspector Training Course  
Module 8: Calculations/Reporting

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One very nice thing about the metric system is the way that lengths relate directly to volumes. A cubic meter is exactly that - the volume of a cube 1m. high x 1m.wide x 1m. deep.

If you divide a cubic meter by 1000 you get the base unit of volume for the metric system - the liter. By definition 1000 liters = 1 cubic meter.

NOW, since the density of water at 15 degrees C = 1.00000 what does 1 cubic meter of water weigh?

1 METRIC TONNE (remember, weight = Volume x Density)

## 8. Calculations & Reporting (page 4)

**AmSpec** Field Inspector Training Course  
Module 8: Calculations/Reporting

### Floating Roof Tanks

On a shore tank with a floating roof, the weight of the roof will displace an amount of product. It will, in fact, cause the level in the standpipe to change quite significantly – that is, it will force some of the product up the standpipe.

The weight of the roof affects the amount of change. A light roof will change the gauge less than a heavy roof.

Since the roof displaces its own weight, by definition, the weight or API gravity of the product will also affect this amount.

So, to do roof corrections, both the weight of the roof and the observed density of the product in the tank must be taken into consideration.

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**AmSpec** Field Inspector Training Course  
Module 8: Calculations/Reporting

### Roof Corrections

Tanks are calibrated for the service that they are going to be used for. A gasoline tank will be originally strapped for an API of about 65.0, whereas a tank intended for fuel oil could be originally strapped for an API of say 15.0.

Roof corrections will be small if the tanks remain in the same service. Roof corrections tend to get large when, for example, a gasoline tank is used for a heavier product such as # 6 oil.

Questions - When doing a roof correction do you use the API at 60, or at the observed temperature? (Answer is --Always the Observed) How do you find this info? (Use Table 5B, the temperature, and the API at 60)

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**AmSpec** Field Inspector Training Course  
Module 8: Calculations/Reporting

### Unusual Circumstances

Water/Snow/Ice on the roof - what do you do?  
Call the Office and protest. Can the terminal use a different tank????  
When would this affect the numbers?  
If the amount changed during the transfer, or if the roof went from sitting on legs to floating or vice versa.  
Would it be a problem if the quantity of water did not change? If so, when?  
See above... Legs to Floating or from Floating to Legs

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**AmSpec** Field Inspector Training Course  
Module 8: Calculations/Reporting

### CRITICAL ZONES

It is easy to apply roof correction when the roof is fully afloat, and, of course, it is not needed when the roof is "on its legs".

What about when the roof is "partially afloat" - in the "CRITICAL ZONE". What do you do?

Answer is that you DON'T USE IT

The only correct way to deal with a roof in the critical zone is to transfer into or out of it until it is clear of the zone, either fully afloat, or fully on its legs. (Or use another tank altogether)

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**AmSpec** Field Inspector Training Course  
Module 8: Calculations/Reporting

### Amspec's Three Cardinal rules for Critical Zones

Rule 1. Call the Office, Rule 2. Call the Office, Rule 3. Call the Office

If possible, check that a roof will not be in the critical zone on the completion of a movement - this is proactive.

Take a few minutes to check that this is not going to happen, before the job starts.

If you suspect it might - make your phone calls!

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**AmSpec** Field Inspector Training Course  
Module 8: Calculations/Reporting

### INTERPOLATION

If we have two or more known values, interpolation allows us to calculate and an intermediate value. For example:

If 20 inches = 100 gallons  
and 30 inches = 200 gallons

What is 25 inches equal to?

Absolutely...150 gallons!

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## 8. Calculations & Reporting (page 5)

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Basic rules to follow for all interpolations

1. Find the difference between the first two numbers ( i.e. 20 to 30 = 10)
2. Find the difference between the second two ( i.e. 100 to 200 = 100)
3. Divide the second by the first and the result is "how much the second changes for each single unit of measure that changes"  
i.e.  $100 / 10 = 10$ . So, If the first number changes by one, the second changes by 10 in proportion

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A MORE REALISTIC EXAMPLE

Imperial Units....

$22'06'' = 64,813.70$  Barrels  
 $22'07'' = 65,055.29$  Barrels

How many is  $22'06 \frac{5}{8}''$

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A METRIC EXAMPLE

$3.00M = 92,775$   
 $3.10M = 90,573$   
 What is 3.04?  
 What is 3.095?

Bonus - how about 3.13? Is this interpolation?

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Extrapolation

Means you are using numbers outside of your range of information

Is OK so long as the shape remains regular - i.e. a cylinder or a box shape

Is incorrect for irregular object like cones or spheres.

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VEF - Vessel Experience Factor

Shore tanks are usually nice regular shapes - cylinders - and as such, apart from the cone at the bottom, are easy to calibrate and make tables for

The bottoms are normally water metered, so the resulting strapping charts are as the main quite accurate

Ships have tanks that are not regular, 1p & 1s for example. They also have beams, girders, etc. Tables may not be so accurate for these reasons

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The VEF compares the two

The VEF is a historical comparison of the difference between the vessel and shore quantities. Figures are adjusted for ROB or OBQ as needed, and a FACTOR is generated that, if applied to the vessel numbers, will give you a theoretical shore number.

The VEF is a very useful tool to determine if losses occurred at loadport or discharge port.

## 8. Calculations & Reporting (page 6)

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Module 8: Calculations/Reporting

### VEF - Discussion Topics

Tables used  
Vessel and shore figures produced using the same table for each.

OBQ/ROB  
Should be deducted from vessel figures

Part Cargoes  
May be used but only if you have sufficient data and your voyage is a similar volume

Lightering Operations  
Should not be used - too many inaccuracies

Segregations on board  
You can work up vef's by natural segregations on board if you like...if the ship is in regular trade of this kind.

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Module 8: Calculations/Reporting

### Data for VEF preparation

| Voy# | Date     | Port       | Vessel | Shore  | TH  |
|------|----------|------------|--------|--------|-----|
| 35   | 5/26/98  | Bonay      | 866426 | 004782 | 6A  |
| 35   | 4/03/98  | Quanta     | 937541 | 925641 | 54A |
| 34   | 2/16/98  | Cape Lopez | 887740 | 887699 | 54A |
| 33   | 1/13/98  | Bonay      | 963726 | 905503 | 6A  |
| 32   | 11/23/97 | Forcadax   | 928732 | 972798 | 6A  |
| 31   | 10/2/97  | Brass      | 911833 | 912451 | 6A  |
| 30   | 9/12/97  | Kala       | 929461 | 926530 | 54A |
| 29   | 8/28/97  | Kala       | 927315 | 925452 | 54A |
| 28   | 7/03/97  | Cape Arcas | 866783 | 867429 | 6A  |
| 27   | 6/01/97  | Forcadax   | 887429 | 866435 | 6A  |
| 26   | 4/12/97  | Quanta     | 911275 | 030746 | 54A |
| 25   | 2/22/97  | Jacmarus   | 899426 | 895718 | 6A  |
| 24   | 1/05/97  | Diexarus   | 887029 | 866833 | 6A  |
| 23   | 12/17/96 | Forcadax   | 868421 | 868794 | 6A  |

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Module 8: Calculations/Reporting

### VAR - Voyage Analysis Report

The VAR is a comprehensive summary that allows us and the customer to view the "Big Picture" of an overall movement on a single page.

Loading, In-Transit, and the discharge are shown on a single page.

The VAR is the first step in determining if there has been actual loss and whenever possible should be completed on an ongoing basis.

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Module 8: Calculations/Reporting

### Other Summaries

Sometimes we do not complete a VAR, but instead complete smaller summaries. These are used as in "Barge to Shore comparison" and the like.

On ANY transfer, load, discharge, pipeline or anything, Inspectors **MUST** do a summary comparison before leaving the job to make sure that we are "in the ballpark". TOV will suffice at a minimum.

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Module 8: Calculations/Reporting

### General Reporting

Often, the only thing that the customer sees regarding the job is the final report. It does not matter that you put in 48 hours straight or whatever. If the report is not good, neither are we.

The final report must be complete, detailed, and error free. There are a few things that we should do to make this happen....

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Module 8: Calculations/Reporting

### Tips

Complete as much paperwork as you possibly can when you are at the vessel for the opening inspection. Items such as vessels particulars, and collecting wedge information can be done.

Keep up-to-date. Do NOT rely on the "dockman" to keep you advised. Don't rely on the dock log or the ship for times etc. Use this information to verify your info. It is our job to report factually, independently, and on time.

## 8. Calculations & Reporting (page 7)

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Module 8: Calculations/Reporting

**Computer Benefits include:**

- Reduced Errors – formulas eliminate math problems
- Reduced time – especially in the case of a rework
- Faster reporting
- Better communications
- Customer access
- Enhanced company image

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Module 8: Calculations/Reporting

**ANY QUESTIONS?**

**GOOD**

**HERE ARE SOME FOR YOU**

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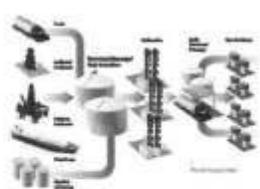
9. General Industry Knowledge (page 1)

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## General Industry Knowledge

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## Oil



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## Main Crude Oil movements



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## What's in a Barrel of Crude Oil

- Finished Motor Gasoline 19.65
- Diesel Fuel Oil 18.68
- Kero-Type Jet Fuel 4.87
- Residual Fuel Oil 3.73
- Sulfur Oil 1.20
- Petroleum Coke 2.18
- Liquefied Petroleum Gas 1.48
- Asphalt and Road Oil 1.34
- Naptha for Feedstocks 0.67
- Other Oils for Feedstocks 0.55
- Lubricants 0.46
- Special Naphtas 0.13
- Kerosene 0.17
- Miscellaneous Products 0.17
- Finished Aviation Gasoline 0.04
- Waxes 0.04

**Total 48.77 Outlets**

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## Shipboard Operations



Pictured above is a typical oil tanker



On the left is an Oil Bulk Ore (OBO) vessel

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Product carriers tend to be smaller than crude carriers. The tanks are usually segregated so as to carry and discharge several grades of cargo simultaneously. The decks are frequently more cluttered than a crude carrier with more pipe work and cargo processing tanks.



## 9. General Industry Knowledge (page 2)

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Tanker decks are usually a mass of pipes valves and vents.



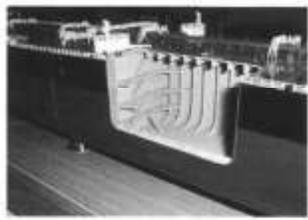
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### Double Hulls

Currently, the world tanker fleet, which was once almost entirely composed of single-skinned vessels, is being modernized and within a few years all tankers will have double hulls.

The space between the hulls, which, when the cargo tanks are full of oil, will be empty, and are used for salt water ballast when the cargo tanks are empty. These spaces, which are considerable on a Very Large Crude Carrier, extend from the double bottom right up to the deck on either side, and have to be checked regularly to ensure that the coatings are intact, and that there is no sign of oil leaking from the cargo tanks into these spaces. Many owners paint these double hulled spaces with light colored coatings, so that any oil leak will be immediately apparent.

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Liquid gas carriers, especially the pressurized type, are characterized by their tanks, usually cylindrical or spherical, which are prominent along the deck of the vessel. Non pressurized vessels may look more like a refined products carrier as the box shaped tanks are not so visible.



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From the outside chemical tankers look similar to refined products carriers. The difference lies with the tanks which must be lined with a suitable material which is inert to the cargo and may be capable of heating or cooling the cargo. Also the hold may be divided up into many well isolated tanks to allow the carriage of many types of chemical simultaneously.



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### Shipboard Operations

- Inert Gas Systems
- Tank Washing
- Pumps and Pipeline Systems
- Fuel and Fuel systems (Bunkers)
- Ballasting
- Squeeze dry
- Chemical Tanker specialization

## 9. General Industry Knowledge (page 3)

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### INERT GAS SYSTEMS

Usually "dirty" boiler (flue) gases are used. The gas is passed through a "scrubber" and then goes to the tanks.

Some systems are purpose built to produce "clean" inert gas - used on low volume applications such as on product or chemical tankers.

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### SCRUBBER

A water chamber that the flue gas passes through that removes soot and soluble impurities such as some sulfur compounds. The chamber is like a shower filled with "ping pong balls" to increase the available surface area for cleaning.

### DECK SEAL

A "water trap" like under the sink - only much bigger! Designed to prevent any back-flow of potentially explosive gases to the engine room spaces. Also usually includes a mechanical "flash back arrester" system.

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### TANK CLEANING

Tank cleaning falls into two broad categories; crude oil washing and water washing. Since we will discuss crude oil washing as a separate topic - we will concentrate here on water washing operations only.

Most large vessels nowadays have fixed tank cleaning systems. Tanks are equipped with permanently fitted machines that can be used for water, or crude washing.

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### FIXED MACHINES

More powerful and are adjustable. Can be set for a full wash or a top, middle or bottom wash only. For example, a setting of 0 degrees to 40 degrees would be a bottom wash from straight down to 40 degrees up the ship's side.

Portable machines usually are capable of doing a "full wash cycle" only.

The engine room usually has the facility to pass the wash water through a heat exchanger so that the tanks can be "hot washed". Also, provision is often available for tank cleaning chemicals to be added to the wash water.

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### SLOP TANKS

Slops from the tank being cleaned are collected and allowed to settle out - usually in the slop tanks - and are also often recirculated - sometimes with a cleaning chemical added.

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### CRUDE OIL WASHING

This system has great benefits. The wash medium used is the cargo itself. In addition to the mechanical impact of the fluid striking the tank surfaces... the oil also has a solvent quality which actually dissolves wax fall out, and gets sediments back into suspension.

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## 9. General Industry Knowledge (page 4)



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### BENEFITS AND DRAWBACKS

For the vessels - they no longer have large wax and sediment build up in the tanks. Stripping is more efficient and it is easier to prepare tanks for clean ballast.

Before crude washing, the tanks would be "mucked out" by hand - not a nice job.

The downside is, of course, that the sediments that would drop out and remain aboard the vessel now go ashore..... so it is the shore tanks that have the problems nowadays...!

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### TYPES OF PIPELINE SYSTEMS

- Free flow
- Ring main
- Double ring main
- Direct Line System

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### FREE FLOW

Found on some VLCC's

- No bottom lines
- Very limited
- Single cargo grade only
- A big valve in the aft bulkhead of each tank.
- Loading is "over the top" through drop - valves

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### RING MAIN

Bottom lines form a ring around the bottom of the ship  
A second smaller ring can be used for stripping  
Or "spur lines" and smaller suction can come off the main lines - limited flexibility

### DOUBLE RING MAIN

As above but "doubled up" - i.e. two rings. Much more flexible - provides for multiple cargo possibilities.

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### PUMPS

- Centrifugal pump
- Reciprocating pump
- Eductor (not really a pump)
- Deep well pumps

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9. General Industry Knowledge (page 5)

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**Centrifugal pump**

Most common  
Needs prime  
Subject to cavitation – not good for stripping  
Good for large volumes

**Reciprocating pump**

Not susceptible to gassing up/cavitation  
Slower rate  
Very good for final stripping  
Usually steam powered

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**Deepwell Pumps**

Usually Rotary displacement pumps  
Found on chemical tankers  
Lower discharge rate  
Good for small parcels  
Good for stripping  
Often "One Tank = One Pump = One Line" (i.e. on Chemical Tankers)

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**Bunkers and Fuel Systems**

Two main types – MDO and HFO  
HFO is much cheaper but must be heated  
Steam ships use only HFO except for emergency generators and in port  
Motor ships run on HFO but usually maneuver on MDO - also use MDO for generators

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**BALLASTING**

Vessels are designed to withstand large shear forces - which may be from internal or external causes

Poor loading or ballasting can result in forces in excess of design limitations which can damage the vessel

Ballasting is carried out to control the stresses and maintain the vessel in a seaworthy state

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**Double hull**

20,000 ton tanks  
100,000 ton tanks

Cargo tanks  
Ballast tanks

Ballast tanks are empty when sailing under load

When sailing empty, 100,000 ton tanks will take on about 10,000 tons of sea water as ballast

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**HOGGING**

Excessive weight at the "ends" of the vessel.  
Mean draft (average of fwd & aft) will be more than the midship draft.

**SAGGING**

The opposite - the vessel is excessively loaded in the middle

## 9. General Industry Knowledge (page 6)

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**CHEMICAL TANKER**

Tank coatings, Heating coils, Vapor returns, P/V valves, Compatibility, Other Cargoes, Wall Wash  
Toxicity

OFTEN HAVE COATED TANKS – POLYURETHANE, EPOXY, ZINC SILICATE, STAINLESS STEEL.

Each one has its advantages and disadvantages, and so far no coating has been developed which is suitable for all chemicals.  
**HOW DO YOU KNOW THAT THE CARGO WILL NOT REACT WITH THE COATING?**  
Ask to see the vessel's coating manual....

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**P/V Valves (Pressure/Vacuum)**

An automatic dual purpose valve, commonly fitted in the vent lines of tankers. When in the closed position, the function of this valve is to relieve excessive pressure or vacuum in a tank while reducing emissions to the atmosphere. When in the open position it will allow the unrestricted passage of air or vapor into and out of the tank.



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**Who are our Clients?**

U.S. Customs and Border Protection  
Refiners  
Traders  
Terminals.

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**Working for U.S. Customs**

All imports and exports (and also FTZ movements) are governed by law (Code of Federal Register).  
We are their eyes and ears  
We have a "Customs Bond" that allows us to act on behalf of Customs  
Our measurements/reports decide what taxes are to be paid to the Government  
We must use our own equipment – properly verified and calibrated and maintained

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Our staff must be qualified and properly trained to perform the job (6 Months minimum)  
They audit us on a regular basis  
Any deviation from procedures can have dire consequences, e.g. not being allowed to work any import/export cargoes nationwide!!!!  
They expect us to follow API procedures on every job.

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**Working for a Refiner**

Normally the large oil companies  
Buy product to refine themselves and sell on to others, or use as fuel in their operations  
What they buy is usually not what they sell  
We usually work in THEIR facilities  
They expect us to follow API procedures on every job.

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## 9. General Industry Knowledge (page 7)

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Module 9: General Industry Knowledge

**Working for a Trading Company**

Have no refineries, ships, gas stations, etc.  
They buy and sell oil as a commodity.  
May sell it immediately, or while the ship is at sea.  
They look to make the maximum amount of profit in the shortest period of time.  
Need constant care, updates, - and sometimes advice.  
Often retain the services of "Loss Control" Consultants (Work 100% for the Trader)  
Remember we are **INDEPENDENT** so do not be influenced by what these consultants say!  
They expect us to follow API procedures on every job.

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**Working for a Terminal**

Our clients often store product at terminals  
We work together with the terminals to ensure that all stored products are accurately accounted for and kept segregated  
Terminals usually have cargoes on hand belonging to many different clients  
Inaccurate measurements may mean loss of product/money to our clients  
They expect us to follow API procedures on every job.

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**ANY QUESTIONS?**

**GOOD**

**HERE ARE SOME FOR YOU**

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# ANEXO 15. CUESTIONARIOS DE LOS CURSOS DE CAPACITACIÓN

## 1. Safety and Security

**Section 1 - Safety Test**

This test is to be taken after completing the Safety (Part 1 of 3) of the Field Inspector Training Course. A score of 80% is required (20 of 25). The inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the inspectors training records and should be countersigned by the Manager as indicated. Please allow 30 minutes maximum for this test.

Inspector Name (Print) \_\_\_\_\_ Date \_\_\_\_\_  
Office \_\_\_\_\_

- You are instructed to sample a tank of methyl tertiary butyl ether (MTBE) which is a new product for you. Where should your first line of information be?
  - The Tankerman's Handbook
  - The Petroleum Handbook
  - The Material Safety Data Sheet (MSDS) for that product
  - API Chapter 5
- Regardless of the product, sample containers MUST NOT be filled in excess of:
  - 80%
  - 85%
  - 95%
  - 100%
- The minimum personal protective equipment required in the field is:
  - Gloves, respirator, hard hat and SCBA
  - Safety glasses, hard-hat, fire retardant uniform & safety shoes
  - Gloves, face-shield and sun glasses
  - Gloves, uniform and SCBA
- When working at dockside or aboard, you are required to wear a Personal Flotation Device (PFD or work vest).
  - True
  - False
- Inspectors are permitted to operate valves on board vessels when:
  - Accompanied by an authorized person on board
  - No one else is around to do it
  - The vessel staff is too busy to do it themselves
  - None of the above

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- Your first reaction to any accident with an injury should be:
  - To protect the injured person, if possible, from exposure to further injury
  - To call for help
  - To render First Aid
  - To report immediately to the person's supervisor
- The responsibility for an inspector knowing the safety regulations in any Terminal belongs to:
  - The terminal staff
  - The terminal's safety director
  - The inspector
  - The inspector's dispatcher
- On the NFPA diamond-shaped chemical hazard warning symbol, the color Red stands for:
  - Reactivity hazard level
  - Fire hazard level
  - Corrosive hazard level
  - Health hazard (toxicity) level
- On the NFPA diamond-shaped chemical hazard warning symbol which number represents the highest danger level?
  - 1
  - 4
  - 3
  - None of the above
- What is a "CAS Number"?
  - A communication and shipping number assigned to a product by the manufacturer
  - A chemical formula number used to identify the product
  - A unique identifying number assigned to a product by the Chemical Abstract Service
  - An identifying number used by manufacturers to assign categories of chemicals for sale
- Which of the following is defined as a corrosive liquid?
  - An acid solution
  - A caustic solution
  - Neither of the above
  - Both a. and b.
- What does the symbol H<sub>2</sub>S stand for?
  - Water 2
  - Hydrogen Chloride
  - Hydrogen Sulfide
  - Dihydrogen

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- Before taking a gauge, static electricity can be discharged from your body by:
  - Using a tank gauge meter
  - Touching a grounded structure such as a tank railing, with bare hands
  - Use of natural fiber sampling cords
  - Touching a grounded structure such as a tank railing, while wearing rubber gloves
- While sampling a crude ship, a small fire breaks out in the pump room. You should:
  - Grab a type C fire extinguisher and enter the pump room
  - Close the hatch and call for the launch
  - Continue sampling because the crew will take care of the fire
  - Immediately secure your area and report to a responsible ship's officer
- In addition to AmIinspect's Sample Form (SR1) DOT requires you to carry:
  - An MSDS Sheet for each product
  - The appropriate guide page from the North American Emergency Response Guide
  - Both A & B
  - Either A or B
- The best source of information about the hazards of any product being inspected is:
  - The inspector's dispatcher
  - A knowledgeable chemist
  - The inspector's previous experience
  - Material Safety Data Sheets
- A tank with an external floating roof is considered a confined space:
  - When the roof is located anywhere under the top ring or course of the tank plates
  - Only when the tank is empty
  - Only when the roof is resting on its legs
  - None of the above
- Which of the following are considered to be confined spaces?
  - A cofferdam
  - An external floating roof tank below the first ring
  - A ship's pump room
  - All of the above
- What is the safe oxygen content range in a confined space?
  - Between 18.5% and 21.0%
  - Between 18.0% and 20%
  - Between 19% and 25%
  - None of the above

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- A confined space is one that:
  - Has limited means of access and exit
  - Is not designed for continuous occupation
  - Has limited natural ventilation
  - All of the above
- Before entering a Confined Space which of the following tests are required?
  - Oxygen content
  - Lower explosive limit
  - Toxic gas testing
  - All of the above
- Someone must always stand watch at the entrance to the confined space while you are in it.
  - True
  - False
- Benzene is a known health hazard. Which of the following are likely to contain benzene?
  - Crude Oil
  - Gasoline
  - Ethylbenzene
  - All of the above
- Hydrogen sulfide may be present in all petroleum products, crude oil and many types of petrochemicals.
  - True
  - False
- Hydrogen Sulfide is probably the most dangerous gas commonly encountered in the petroleum industry.
  - True
  - False

Score = \_\_\_\_ / 25 = \_\_\_\_ %

I certify that the inspector named above has satisfactorily completed "Safety" (Section 1 of 3) having attained over 80%, and he/she has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_  
Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

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## 2. Ethics & Short Cuts

**Section 2 - Ethics & Short Cuts Test**

This test is to be taken after completing the Ethics and Short Cuts (Part 2 of 9) of the Field Inspector Training Course. A score of 80% is required (10 of 20). The Inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the Inspector's training records and should be countersigned by the Manager as indicated. Please allow 30 minutes maximum for this test.

Inspector Name \_\_\_\_\_ Date \_\_\_\_\_  
Office \_\_\_\_\_

1. AmSpec's business is founded on the principle of independence and impartiality.
  - a. True
  - b. False
2. The key person involved in managing ethics concerns at AmSpec is:
  - a. The President
  - b. The Branch Manager
  - c. The Compliance Officer
  - d. The Building Manager
3. Which of the following are examples of unethical business behavior?
  - a. Sexual Harassment
  - b. Bribery
  - c. Manipulating Results
  - d. All of the above
4. The Foreign Corrupt Practices Act prohibits:
  - a. Illegal activities of U.S. citizens while abroad
  - b. Illegal activities of U.S. Government Officials abroad
  - c. Illegal activities of U.S. Corporations when conducting business abroad
  - d. Illegal activities of any foreign citizens while working in the U.S.
5. You are working on a job and a loss control representative repeatedly attempts to have you record gauges as being slightly more than you are finding i.e. 10' 6 1/2" rather than 10' 6 1/8". You should:
  - a. Comply with his request since he is working for your client.
  - b. Politely refuse to change any gauges.
  - c. Report his behavior to your office, and thereby to Customs.
  - d. b and c above

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6. You have tested a sample and found the Sulfur content to be 1.02. The maximum stated in the contract is 1.00. You have tested it three more times and obtained results of 1.02, 1.01, 1.00. Your best client wants the 1.00 to be reported. You can do as the client requests.
  - a. True
  - b. False
7. Your job orders require you to gauge a shore tank. Upon arrival you discover terminal personnel have already gauged the tank and they request that you sign their gauge ticket which states you witnessed the gauging. Do you:
  - a. Sign the ticket
  - b. Sign the ticket and copy the information onto AmSpec's gauge ticket
  - c. Refuse to sign as you did not actually witness the gauging
8. Zero Tolerance means:
  - a. No second chance
  - b. Someone who can't hold their liquor
  - c. Three strikes and you're out
9. Which of the following applies to you?
  - a. If you work for AmSpec, you must not do anything that breaks the law
  - b. If you work for AmSpec, you must not do anything that is immoral or improper
  - c. If you work for AmSpec, you must not do anything that could even appear to be immoral or improper
  - d. All of the above
10. A Lab Technician hurts his back at work and is out on disability/workers' compensation. However, you have recently discovered that he is employed as a doorman/bouncer every Friday night at the local pool hall. Are you obligated to report this to the company?
  - a. Yes
  - b. No

**SHORT CUTS**

11. If you are caught taking short cuts on the job, you will be fired.
  - a. True
  - b. False
12. Your written job orders require that you gauge and temperature all barge tanks. You take one gauge and one temp per tank. Is this a short cut?
  - a. No, as you're only required to take one gauge and temp per barge tank.
  - b. Yes, as this does not follow API or AmSpec's procedures

2

13. An inspector is dispatched to take a running sample from a shore tank. The sample bottle comes up full. To save time and energy he decides to pour off a portion so that the bottle is approx 90% full. Sample is capped and tagged as a running sample. Is this OK?
  - a. Yes, as this is API procedure for pulling running samples
  - b. No, as this is not per API procedure
  - c. Yes, as it's almost impossible to pull a good running sample.
14. When YOU sign your name on your field paperwork, you:
  - a. Should feel comfortable that you did the job properly
  - b. Should feel comfortable that you did the job as well as could be done
  - c. Should feel you are a professional
  - d. All of the above
15. If you are taking short cuts you are not only gambling with your own job security, but you're also gambling with the jobs of everyone in your office and even in other offices.
  - a. True
  - b. False
16. An inspector is dispatched to take a running sample from each of 6 barge tanks. The samples are to be taken to the lab, composited and tested. The inspector decides to take a gallon composite as it takes less time and may help out the lab. Is this acceptable?
  - a. Yes, since the lab was to prepare a composite anyway.
  - b. No, as his job orders specified a running sample from each tank.
17. It is late and rainy so our inspector decides not to water out the vessel's tanks. Upon arrival at diport the vessel is found to have 1,000 lbs. of water on board. The client stands to lose \$70,000. What are the consequences?
  - a. AmSpec pays a \$70,000 claim
  - b. The Inspector loses his job
  - c. Both of the above
18. An inspector decides in order to save time he'll take all his samples from one vessel tank, instead of sampling every tank. The samples are analyzed and are found to be on-spec. At diport, a vessel composite is prepared and the cargo is found to be off spec. Individual tank samples show that 4 of the 10 tanks were off-spec. The client expects to lose \$500,000. What are the consequences?
  - a. AmSpec pays a \$500,000 claim
  - b. The Inspector loses his job
  - c. Both of the above
19. Our inspector is gauging a vessel off-shore in rolling seas. He has one last tank to gauge when he is informed that the launch is leaving. He decides to take 3 gauges and average them. As such his measurement is off almost a foot and our client experiences a financial loss. What are the consequences?
  - a. AmSpec pays a claim
  - b. The Inspector loses his job
  - c. Both of the above

3

20. On a jet fuel cargo, an inspector decides not to sample all tanks. The cargo is found to be on-spec based on the samples taken. This fuel is pumped aboard an airplane bound for Singapore. Four hours into the flight the plane experiences engine trouble due to poor quality fuel, and crashes into the ocean. What are the consequences?
  - a. None, as this will never happen at AmSpec

Score = \_\_\_\_/20 = \_\_\_\_ %

I certify that the inspector named above has satisfactorily completed "Ethics & Short Cuts" (Section 2 of 9) having attained over 80%, and has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

4

### 3. Sampling

**Section 3 - Sampling Test**

This test is to be taken after completing the Sampling (Part 3 of 9) of the Field Inspector Training Course. A score of 80% is required (20 of 25). The inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the Inspectors training records and should be counter-signed by the Manager as indicated. Please allow 30 minutes maximum for this test.

Inspector Name \_\_\_\_\_ Date \_\_\_\_\_

Office \_\_\_\_\_

- Which API MPMS Chapter describes the procedures for manual sampling of petroleum and Petroleum Products?
  - Chapter 17.1
  - Chapter 8.1
  - Chapter 8.2
  - Chapter 3.1
- Rinsing the container with the liquid to be sampled before drawing the sample is recommended for:
  - Jet fuel samples
  - Petrochemical samples
  - Vapor pressure samples
  - All of the above
- Jet fuel should not be sampled with equipment that contains brass, copper or copper alloy.
  - True
  - False
- What equipment does API prefer to lower a sample bottle to the required level?
  - Usage tape
  - Cotton cord or non-sparking chain marked to indicate when the correct level has been reached
  - Image tape
  - None of the above
- Fire water in a crude oil tank is best sampled using a:
  - Zone sampler
  - Bacon bomb or tube-type sampler
  - Bottle and sample cage
  - Weighted bottle and cord

3

- A sampling cage and bottle is generally better than a weighted sampling beaker for sampling volatile liquids because:
  - The equipment is easier to handle
  - A beaker sample is probably less representative
  - Loss of light ends is likely when the sample is transferred from the beaker
  - Sample bottles are readily available
- When would you take a free water sample?
  - When requested by the customer
  - They are not necessary
  - Immediately after every loading, except chemicals
  - Whenever there is a sufficient quantity to sample
- A representative sample is a portion extracted from the total volume that contains its constituents in the same proportions as those present in the total volume.
  - True
  - False
- API MPMS Chapter 8.1 recommends that a vapor space be left at the top of each sample container to:
  - Permit the surface of the liquid to be visible in the laboratory
  - Allow space to vent the vapor content of the sample
  - To allow space for safe expansion of the liquid
  - To avoid the loss of light components
- A sample obtained by lowering a stoppered container to the draw-off level of a tank, removing the stopper and withdrawing the container at a steady rate is called a:
  - Spot sample
  - Running sample
  - All-levels sample
  - Composite sample
- Before sampling oil in a tank, it is necessary to locate the oil/water interface.
  - True
  - False
- After obtaining a tank running sample, the inspector notices that the sampling bottle is full on withdrawing it from the tank. The inspector should:
  - Pour some of the sample into a second container
  - Pour some of the sample out of the bottle
  - Empty the sampling bottle completely and obtain a new sample
  - Any of the above
- When you are instructed not allow the sampling cord to fall on the deck, the main concern is:
  - The chance of contamination
  - Making a mess that could cause a slip hazard
  - Wearing out the cord
  - Both a and b

3

- When sampling a shore tank with an observed API gravity of  $-2^{\circ}$ , and the main content is water. Where would the water most likely be?
  - 6' off the bottom
  - Stratified between the lower and middle levels
  - Floating on top of the cargo
  - No water can be found in negative API oils
- The danger of static electricity can be reduced by:
  - Wearing rubber gloves
  - Not allowing your hands to slide on the tank hand-rail
  - By grounding yourself and your equipment before opening the hatch cover
  - Using stainless steel equipment
- What laboratory test will most likely be affected by using a sampling cord that was first used in black oil then used in clean oil?
  - Color
  - R.V.P.
  - S and W
  - Flash Point
- Since the volume of material in the tank plays no part in the lab analysis, tanks that are sampled do not need to be gauged.
  - True
  - False
- The correct procedure for taking a jet fuel sample is:
  - First take a sample in a clear bottle to examine for color and sediment. Then take the official sample in amber bottle
  - Use an amber bottle
  - Use only a clean zone sampler
  - Sample just below the surface as to keep from getting any free water in it
- Samples should not be taken from an unlisted standpipe.
  - True
  - False
- A storage tank was manually gauged and found to have a product image of 58 feet 6 inches. The tank gauge height is 48 feet 10 inches. At what image level should the lower spot sample be obtained?
  - 3 feet from the tank bottom
  - At the outlet (puction) level
  - 6 feet 5 inches from the tank bottom
  - 12 feet 10 inches from the tank bottom

3

- Both free water and entrained water are found in the sample taken by an automatic in-line sampling system.
  - True
  - False
- An automatic sampling system consists of:
  - Probe
  - Receiver
  - Controller
  - All of the above
- Before each use the sample receiver of an automatic sampling system must be inspected to ensure that it is clean and dry.
  - True
  - False
- A sample that is to be tested for Reid Vapor Pressure (RVP) should be taken with:
  - A zone sampler
  - A glass bottle with suitable cage or weight
  - A bomb sampler
  - A Tulsa Thief
- Samples should be labeled:
  - In the laboratory
  - Immediately after the sample is obtained.
  - Before transportation to the laboratory.
  - Immediately upon arrival in the laboratory.

Score = \_\_\_\_ / 25 = \_\_\_\_ %

I certify that the inspector named above has satisfactorily completed "Sampling" (Section 3 of 9) having attained over 80%, and has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

4

## 4. Temperatures

**Section 4 - Temperatures Test**

This test is to be taken after completing the Temperatures (Part 4 of 9) of the Field Inspector Training Course. A score of 80% is required (16 of 20). The Inspector **MUST** receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the inspectors training records and should be countersigned by the Manager as indicated. Please allow 1 hour maximum for this test.

Inspector Name \_\_\_\_\_ Date \_\_\_\_\_

Office \_\_\_\_\_

- Is a portable electronic thermometer required to have a low voltage indicator?
  - Yes
  - No
- Temperatures obtained using portable electronic thermometers should be read and recorded to the nearest:
  - 0.1 °F or °C
  - 0.5 °F or °C
  - 1.0 °F or °C
  - 1.5 °F or °C
- What is the first thing you must do when using a portable electronic thermometer?
  - Set the temperature range selector.
  - Ground the unit, after opening the gauge hatch
  - Check the battery for low voltage.
  - Ground the unit, before opening the gauge hatch
- If a tank has more than ten feet of liquid, what is the minimum number of temperature readings that must be taken?
  - 3
  - 2
  - 1
  - one every 2 feet
- If only one temperature is required, where should this temperature be taken from?
  - The middle of the upper third
  - The middle of the liquid
  - The middle of the lower third
  - Use a side readout thermometer

- The quickest way to stabilize the reading from a portable electronic thermometer is to:
  - Allow the probe to stay in the product for twice the required time
  - Move the probe up and down at least one foot above and below the spot the temperature is to be taken
  - Use fresh batteries
  - There is no way to speed up the temperature process
- What is the minimum amount of product needed for a temperature to be taken?
  - Whichever there is sufficient material present to immerse the probe
  - One foot
  - Ten feet
  - Only when the roof is free floating
- The minimum amount of time that an "in motion" probe should stay in a product with an API gravity of less than 20 is:
  - 30 minutes
  - 30 minutes
  - 75 seconds
  - 1 minute
- When using a portable electronic thermometer and having the probe in motion, what is the indication of temperature stabilization?
  - The side temperature on the tank
  - Using the cup-case for comparison
  - Last recorded temperature by the terminal
  - Readout does not vary by more than 0.2 F for 30 seconds
- According to API MPMS Chapter 7, a mercury-in-glass thermometer in a cup-case assembly must be verified against a NIST certified thermometer when new and at intervals thereafter of at least:
  - 3 months
  - 6 months
  - 1 year
  - 5 years
- Temperatures taken with a mercury-in-glass thermometer in a cup-case assembly should be read and recorded to the nearest:
  - 1.0 °F
  - 0.1 °F
  - 0.5 °F
  - 5.0 °F

- What temperature is to be used during a ROE survey if there is only 2 inches of liquid in the bottom of the tank?
  - The measured temperature at the middle of the liquid
  - 80°F
  - The average temperature of the product in the tank before it was discharged
  - The temperature stated by the vessel's representative
- The immersion time for a cup-case assembly is minimized by continually raising and lowering the assembly 1 foot above and below the desired temperature measurement point.
  - True
  - False
- In a storage tank containing less than 5,000 barrels, what is the minimum number of cargo temperature readings that will suffice?
  - Three – an upper, middle and lower temperature
  - Two – an upper and lower temperature
  - One – a middle temperature
  - You don't have to obtain a temperature; you can use the product temperature from the above tank.
- For Asphalt a regular probe will be unsuitable.
  - True
  - False
- Daily Thermo-probe checks should be recorded on the Time Log
  - True
  - False
- API 17.1 states that the use of Electronic Probes is preferred over using thermometers.
  - True
  - False
- Lighter products expand with temperature faster than heavy products.
  - True
  - False
- In the USA, GGV is the volume at
  - 15C
  - 62F
  - 20C
  - Ambient temperature

- Oil is a good insulator.
  - True
  - False

SCORE = \_\_\_\_ / 20 = \_\_\_\_ %

I certify that the Inspector named above has satisfactorily completed "Temperatures" (Section 4 of 9) having attained over 80%, and he/she has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

## 5. Gauging & Measurement

### Section 5 - Gauging and Measurement Test

This test is to be taken after completing the Gauging & Measurement (Part 5 of 8) of the Field Inspector Training Course. A score of 80% is required (20 of 25). The Inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the inspector's training records and should be countersigned by the Manager as indicated. Please allow 1 hour maximum for this test.

Inspector Name (Print) \_\_\_\_\_ Date \_\_\_\_\_

Office \_\_\_\_\_

- The critical zone in a shore tank defines that part of the tank where:
  - The floating bottom of a tank is at its highest point
  - The point where the tank will overflow if more liquid is added
  - The floating roof is no longer resting on its legs
  - The vertical section of a tank identified on the capacity table where the floating roof is only partially afloat and the table may be inaccurate
- A Tank Capacity Table is also referred to as a Tank Strapping Table.
  - True
  - False
- An inrage gauge measures:
  - The distance from the surface of the liquid in the tank to the reference gauge point of the tank.
  - The distance between the point where the floating roof of the tank is floating freely and the point where it is resting fully on its supports.
  - The level of liquid in a tank measured from the datum plate or tank bottom to the surface of the liquid.
  - The distance from the tank datum plate or bottom to the tank reference gauge point.
- An outage (or ulage) gauge measures:
  - The distance from the tank datum plate or bottom to the tank reference point.
  - The distance from the surface of a liquid in a tank to the reference gauge point of the tank.
  - The amount of product transferred out from a tank.
  - The level of liquid in a tank measured from the tank bottom to the surface of the liquid.
- Water indicating paste is used to:
  - Determine the SGW of the product in the tank
  - Detect the presence of suspended water within the product in the tank
  - To indicate the product / free water interface within the tank
  - None of the above

1

- An inrage gauge bob is pointed to aid in penetration of tank bottom sediment, and its zero point is at the:
  - Top of the eye
  - Bottom of the eye
  - Tip of the bob
  - Inside of the tape swivel
- The observed reference height of a tank is:
  - The distance from the reference point to the bottom of the tank or the datum plate as measured during the gauging operation
  - The distance from the reference point to the bottom of the tank or the datum plate as shown on the tank capacity tables
  - The distance from the ullage pipe to the liquid level
  - Usually written somewhere on the ullage pipe
- On a shore tank, what is the distance between the Reference Gauge Point and the Datum Point, as measured at the time of gauging, called?
  - Observed reference point
  - Reference gauge height
  - Total gauge height
  - Observed gauge height
- An inrage tape and bob may be used to take an outage gauge.
  - True
  - False
- Gauge tape readings must be recorded to the nearest:
  - 1/2 inch
  - 1/4 inch
  - 1/8 inch
  - 3/4 inch
- If an electronic gauging tape (PMU) is used to measure free water, which of the following should be followed?
  - Rely on the PMU alone for free water level measurement because that is the same instrument used to measure the oil level
  - Apply water-finding paste to the bob of the PMU and compare the water level indicated by the paste to the water level indicated by the PMU
  - Rely on water-finding paste alone
  - Recommend to the terminal that the free water received and measured ashore be applied to the vessel figures
- When gauging light products, it is permissible to use chalk or talcum powder to facilitate reading the out on the tape.
  - True
  - False

2

- When using water indicating paste in heavy oils, which of the following actions should you take to enable the paste to be read more easily?
  - Gently blowing on the gauging bar to remove the heavy oil
  - Use a soft cotton rag or towel to remove the excess oil
  - Use a suitable solvent to gently wash to surface of the paste.
  - Immerse the gauging bar in a container full of light product such as gasoline.
- To try to ensure gauging accuracy in shore tanks, the minimum number of gauges recommended is:
  - 1 gauge
  - 2 identical gauges out of a maximum of three
  - 3 identical gauges out of 4
  - 4 gauges averaged
- The use of unaltered standpipes is not recommended for custody transfer measurements.
  - True
  - False
- When gauging a tank by the inrage method, a comparison between the observed and reference gauge height is made to ensure which of the following?
  - The gauge tape and bob are suspended in a vertical position within the tank.
  - The gauge bob is in contact with the tank bottom or datum plate
  - The tape has not been lowered too far into the tank
  - All of the above
- When gauging a shore tank, you read your tape to the nearest 1/16 of an inch.
  - True
  - False
- Can you obtain an accurate volume if you gauge a tank while the roof is in the critical zone?
  - Yes, when the tank legs are on low setting
  - Yes, when the tank legs are on high setting
  - No, it cannot be done
  - No, unless it is an internal floating roof
- When inspecting # 8 F.O. are you required to check for free water.
  - Yes
  - No
- If the density of a product within a tank is greater than the density of water (i.e. <10.0), where would you expect to find any free water located in this tank? You would not find it as it would not settle out of this product but would remain.
  - In suspension
  - On top of the product.
  - Below the product
  - None of the above a Suspension.

3

- Reference heights should be:
  - Recorded from the calibration tables, before you start the tank inspection
  - Checked against the observed reference height
  - Included in the inspection report
  - All of the above
- Free water measurements may be taken by:
  - The inrage method
  - The ullage method
  - The Henrich method
  - Both a and b
- Which of the following is acceptable for the determination of free water for marine vessel custody transfer measurements?
  - A Tulsa thief
  - A portable electronic gauge tape (PMU)
  - A bob with water-finding paste
  - b and c
- If during an inspection the water cut falls on the clip of the gauge tape, what must be done?
  - Repeat the water cut using a 12" or 11" water bar
  - Repeat the water cut taking an ullage of the water
  - Interpolate the out
  - Either a or b
- What is the minimum amount of time the bob must stay in position while water cutting a heavy crude oil?
  - 10 seconds
  - 30 seconds
  - At least 90 seconds
  - There is no set time

Score = \_\_\_\_ /25 = \_\_\_\_ %

I certify that the inspector named above has satisfactorily completed "Gauging & Measurement" (Section 5 of 8) having attained over 80%, and he/she has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_  
Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

4

## 6. ROB & OBQ

**Section 6 - ROB/OBQ Test**

This test is to be taken after completing the ROB/OBQ (Part 6 of 8) of the Field Inspector Training Course. A score of 80% is required (20 of 25). The inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the inspectors training records and should be countersigned by the Manager as indicated. Please allow 1 hour maximum for this test.

Inspector Name (Print) \_\_\_\_\_ Date \_\_\_\_\_  
Office \_\_\_\_\_

- For a trim correction to apply, which of the following conditions must exist?
  - Vessel must be down by the stern
  - Liquid may not contact the forward bulkhead
  - Liquid must touch all four bulkheads
  - All of the above
- Clingage is:
  - The wedge shaped volume of oil remaining in a tank after discharge
  - The non-liquid wedge-shaped volume of oil remaining in a tank after discharge
  - The cargo that adheres to the internal vertical surfaces of a tank after it has been emptied
  - The ability of a liquid to cling to the inside surface of a container
- Deadwood is:
  - A wooden cup-case thermometer cases that are no longer fit for use
  - Any piece of gauging equipment made of wood (e.g. wooden handles of gauge tapes, cup-case thermometer cases) that have been exposed to chemicals and have been damaged as a result
  - Any tank fitting or structural member inside a tank that affects the capacity of the tank
  - None of the above
- The mixture of oil, tank washings, water and sediment found in a designated ship's tank is called:
  - Polluted oil
  - Merchantable oil
  - Slops
  - Hazardous waste
- Draft is defined as:
  - The distance from the surface of the water to the keel of the ship.
  - The distance from the deck of the ship to the surface of the water.
  - The distance from the Plimsoll mark to the bottom of the ship.
  - The distance from the Plimsoll mark to the deck.

1

- The term 'Load on Top' is:
  - The shipboard practice of collecting water and settling water and oil mixtures resulting from ballasting and tank cleaning operations (usually in a slop tank) and subsequently loading cargo on top of and pumping the mixture ashore at discharge port.
  - The act of commingling onboard quantity with cargo being loaded.
  - Both of the above.
  - Neither of the above.
- Wall Wash test is:
  - The activity of rinsing a tank wall with a solvent to determine its compatibility with the product to be placed into the tank.
  - The activity of rinsing a tank with clear, fresh water following tank cleaning to ensure its compatibility with the product to be placed into the tank.
  - The activity of washing the walls of a tank to remove all traces of the product previously contained in the tank.
  - All of the above.
- If the vessel has official wedge tables, they may be used instead of calculating the wedge volume yourself.
  - True
  - False
- According to API MPMS chapter 17, 4 is it permissible to apply the wedge formula to non-liquid ROB or OBQ.
  - Yes
  - No
  - Yes, but only if the trim of the vessel was known at the time the material solidified
  - Yes, but only if a sample can be obtained.
- If a vessel is out of trim and product in a tank is touching all four bulkheads, should you use the wedge formula to calculate the volume?
  - Yes
  - No
- Can a free water volume be calculated using a wedge formula, if the water does not touch the forward bulkhead?
  - Yes
  - No
- What is the first thing you must do when you board a marine vessel?
  - Report to the person in charge
  - Have the tanks open, ready to gauge and sample
  - Always take samples first
  - Always take gauges first

2

- Once sea valves are sealed by an independent inspector, the vessel staff may not operate those valves during custody transfer for any reason without consulting with the inspector.
  - True
  - False
- Ballast is used for the purpose of:
  - Keeping the cargo warm
  - Segregation of the cargo
  - Reducing the ship's fuel consumption
  - Maintaining the vessel's stability, trim, and controlling vessel stress
- A bunker inspection should be performed:
  - Only with fuel oil
  - With every product except gasoline
  - When requested by the vessel
  - Before and after loading or discharging
- An OBQ inspection is performed:
  - Before loading a clean product
  - Before any cargo is loaded
  - Before any chemical is loaded
  - Before loading a clean product after a dirty one
- You have determined that ROB material is non-liquid, but you were only able to measure it from one gauge point. In order to calculate the volume of ROB, you should assume that it is lying evenly across the bottom of the tank.
  - True
  - False
- Why may multipoint gauging be required when performing an OBQ/ROB inspection?
  - To help determine if a wedge condition exists
  - To help determine the nature (liquid or non-liquid) and quantity of the OBQ/ROB
  - Only if the vessel is on even keel.
  - a and b
- Is it correct to apply a wedge calculation to an OBQ/ROB volume if the material is touching all four tank bulkheads?
  - No
  - Yes
- The on board quantity (OBQ) measured at a loading port will usually be greater than the remaining on board (ROB) measured at the previous discharge port.
  - True
  - False

3

- Cargo that adheres to the vertical bulkheads of a tank is referred to as:
  - Slops
  - Clingage
  - Coatings
  - Klingons
- If you are instructed to take manual vessel measurements but the Captain refuses to allow this, what course of action should you take?
  - Contact your supervisor immediately
  - Issue a letter of protest to the vessel
  - Comply with the Captain's wishes
  - a and b
- Should you seal a vessel's sea-valves prior to loading?
  - No
  - Yes
- Measuring cargo through two or more openings in a tank is referred to as:
  - Repetitive motion gauging
  - Duplicate gauging
  - Multi-point gauging
  - Hatch survey
- A pre-loading tank inspection key meeting between vessel personnel, shore personnel and inspection personnel should determine:
  - Tank Number, tank capacity, intended cargo volume
  - The last three cargoes and method of tank cleaning
  - The contents of adjacent tanks.
  - All of the above.

Score = \_\_\_\_ / 25 = \_\_\_\_ %

I certify that the inspector named above has satisfactorily completed "ROB/OBQ" (Section 6 of 8) having attained over 80%, and he/she has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

4

## 7. Line Verification

### Section 7 - Line Verification Test

This test is to be taken after completing the Line Verification (Part 7 of 9) of the Field Inspector Training Course. A score of 80% is required (8 of 10). The inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the inspectors training records and should be countersigned by the Manager as indicated. Please allow 1 hour maximum for this test.

Inspector Name \_\_\_\_\_ Date \_\_\_\_\_

Office \_\_\_\_\_

1. Whether a terminal's shoreline is full, partially full or empty can affect accurate measurement of oil volumes transferred.

- a. True
- b. False

2. Which API MPMS Chapter provides guidelines for determining the fullness of pipelines between vessels and shore?

- a. Chapter 17.8
- b. Chapter 17.3
- c. Chapter 17.7
- d. Chapter 17.2

3. According to API MPMS Chapter 17.1, is the petroleum inspector required to be present at the key meeting.

- a. Yes
- b. No

4. According to API MPMS Chapter 17.8, during a shore inspection:

- a. The Terminal is to tell the Inspector the condition of the line.
- b. A line fullness verification procedure should be requested to verify line condition.
- c. Unless instructed otherwise, the Inspector is to assume the line is full before and after transfer of product.
- d. All of the above.

5. Line Displacement volumes used are always:

- a. TOV
- b. GSV
- c. NSV
- d. TCV

6. It is the vessels responsibility to tell the inspector which tank will be used for a ship to shore line displacement.

- a. True
- b. False

1

7. This method of line verification DIRECTLY affects custody transfer figures:

- a. Internal circulation
- b. High point bleed valves
- c. Line Press
- d. Line displacement from ship to shore

8. The High Point Bleed Valve method can only be used when there are no extensive horizontal pipeline sections.

- a. True
- b. False

9. If there is pressure to get the ship started quickly it is acceptable to write "Said to be full" and waive any line verification.

- a. True
- b. False

10. In the line press method, the line is considered full if the shore tank gauge does not change by more than:

- a. 1/16"
- b. 1/8"
- c. 1/4"
- d. 1/2"

Score = \_\_\_\_ /10 = \_\_\_\_ %

I certify that the inspector named above has satisfactorily completed "Line Verification" (Section 7 of 9) having attained over 80%, and has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

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## 8. Calculations & Reporting

### Section 8 - Calculations and Reporting Test

This test is to be taken after completing the Calculations and Reporting (Part 8 of 8) of the Field Inspector Training Course. A score of 80% is required (20 of 25). The Inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the Inspector's training records and should be countersigned by the Manager as indicated. Please allow 1 hour maximum for the test.

Inspector Name \_\_\_\_\_ Date \_\_\_\_\_

Office \_\_\_\_\_

- When a capacity table indicates a reference API Gravity and an API Gravity correction per barrel variance for a shore tank, the following data must be available to calculate a floating roof correction:
  - Weight of the roof only
  - API Gravity of the contents at 60°F. API Gravity for which the capacity table was calculated. Barrels of correction for each degree of difference in API Gravity
  - Observed API Gravity of the contents. Weight of the roof. Barrels of correction for each degree of difference in API Gravity
  - Observed API Gravity of the contents. API Gravity for which the capacity table was calculated. Barrels of correction for each degree of difference in API Gravity
- If a cargo does not contain S&W, the Gross Standard Volume and the Net Standard Volume are the same.
  - True
  - False
- For a crude oil cargo, what information does the formula  $GOV \times VCF$  give?
  - GSV (Gross Standard Volume)
  - NSV (Net Standard Volume)
  - TCV (Total Calculated Volume)
  - VCF (Volume Correction Factor)
- The Total Calculated Volume is equal to the Gross Standard Volume plus:
  - Free water
  - S&W
  - Roof Correction
  - Free Water and S&W
- For a trim correction to apply, which of the following conditions must exist?
  - Vessel must be down by the stern
  - Liquid may not contact the forward bulkhead
  - Liquid must touch all four bulkheads
  - All of the above

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6. Barge tanks do not require trim corrections because they are too small for a correction to make a significant difference.

- True
- False

7. The API gravity of water at 60°F is:

- 0
- 10
- 15
- 1.0

8. When a vessel's capacity tables are not calculated to 1/8", 0.01", or 3 mm, you should interpolate to calculate the volume at the gauged level in the tank.

- True
- False

9. When the API gravity at observed temperature of a crude oil is known, what table would you use to find the API gravity at 60°F?

- Table 5A
- Table 5B
- Table 24A
- Table 24B

10. How many centimeters equals one inch?

- 3.16
- 2.75
- 2.54
- None of the above

11. What is the equivalent of 0° Celsius on the Fahrenheit scale?

- 0° F
- 32° F
- 50° F
- 32° F

12. A list correction is most similar to which of the following calculations:

- A wedge formula
- A vessel experience factor
- A voyage ratio
- A trim correction

13. It is necessary to know the Vessel Experience Factor of a ship before you can accurately determine whether there has been an in-transit loss or gain of cargo.

- True
- False

14. Which API MPMS Chapter contains guidelines for the Calculation of Petroleum Quantities?

- Chapter 3
- Chapter 8
- Chapter 12
- Chapter 17

2

10. API Gravity is a scale that indicates:

- Density
- Weight
- Thickness
- Ratio of weight to density

16. The abbreviation S&W stands for:

- Sand and Water
- Sediment and Waste
- Scale and Water
- Sediment and Water

17. A US barrel is a volume of:

- 42 U.S. gallons
- 9702 cubic inches
- 158.987 liters
- All of the above

18. Total Observed Volume (TOV) is:

- The total measured volume of all petroleum liquids, sediment and water, and free water at observed temperature.
- The total measured volume of all petroleum liquids, sediment and water but, excluding free water, at observed temperature
- The total volume of all petroleum liquids and sediment and water, corrected by the appropriate volume correction factor, for the observed temperature and API Gravity, to a standard temperature.
- The total measured volume of all petroleum liquids excluding water and sediment, at observed temperature

19. Net Standard Volume (NSV) is:

- The total volume of all petroleum liquids, excluding sediment and water and free water, corrected by the appropriate volume correction factor for the observed temp. and API Gravity, to a standard temperature.
- The total volume of all petroleum liquids, excluding sediment and water, but including free water, corrected by the appropriate volume correction factor for the observed temperature and API Gravity, to a standard temperature.
- The total volume of all petroleum liquids and free water, excluding sediment and water, corrected by the appropriate volume correction factor for the observed temperature and API Gravity, to a standard temperature.
- The total volume of all petroleum liquids and sediment and water and free water, corrected by the appropriate volume correction factor for the observed temperature and API Gravity, to a standard temperature.

20. The reference gauge height of a tank is the distance from the:

- Tank top to the tank bottom
- Ullage hatch to the datum plate
- Reference gauge point to the tank bottom or datum plate
- Tank bottom to the ullage hatch

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21. An image gauge measures:

- The depth of the empty space above the liquid in a tank.
- The depth of the sediment in a tank
- The length of an image tape
- The depth of the liquid in a tank

22. The amount specified to be paid by the Charterer if a vessel is delayed beyond the terms allowed in the Charter Party is called:

- Dispatch money
- Demurrage
- Disbursement
- Penalty money

23. The name given to the factor calculated by comparing the ratio of historical Total Calculated Volumes (TCV) of a vessel (less OQ/ROB) with the corresponding historical Total Calculated Volumes (TCV) of shore delivered volumes is:

- Voyage Analysis Factor
- Tank Correction Factor
- Vessel Experience Factor
- Ullage Correction Factor

24. Trim is defined as:

- The same as the draft.
- The difference between the forward and aft draft.
- The average of the forward draft, the amidships draft, and the aft draft.
- The leaning of the vessel to one side.

25. For the purpose of voyage analysis, a simple voyage is:

- A voyage from one load port to one discharge port with one cargo.
- A voyage from one load port to one discharge port with any number of cargoes.
- A voyage where all measurements were taken with automatic equipment only.
- A voyage that relied on carefully calibrated meters at both the load port and the discharge port.

Score = \_\_\_ / 25 = \_\_\_ %

I certify that the inspector named above has satisfactorily completed "Calculations and Reporting" (Section 8 of 8) having attained over 80%, and has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

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## 9. General Industry Knowledge

### Section 9: General Industry Knowledge Test.

This test is to be taken after completing the General Industry Knowledge (Part 9 of 9) of the Field Inspector Training Course. A score of 80% is required (20 of 25). The Inspector MUST receive additional training and retake the test if less than 80% is scored.

When completed this test sheet becomes part of the Inspector's training records and should be countersigned by the Manager as indicated. Please allow 1 hour maximum for this test.

Inspector Name (Print) \_\_\_\_\_ Date \_\_\_\_\_

Office \_\_\_\_\_

1. When refining a barrel of crude oil, you would expect to obtain more jet fuel than gasoline.
  - a. True
  - b. False
2. Different types of hydrocarbons have progressively higher boiling points so they can be separated. This process is known as "Fractional Distillation".
  - a. True
  - b. False
3. Crude oil contains hydrocarbons.
  - a. True
  - b. False
4. Which of the following products would you expect to obtain when refining crude oil?
  - a. Asphalt
  - b. Kerosene
  - c. Gasoline
  - d. All of the above
5. Vacuum distillation works on the principle that:
  - a. By increasing the temperature in the towers, the boiling points of the heavier fractions are reduced.
  - b. By reducing the temperature in the towers, the boiling points of the heavier fractions are reduced.
  - c. By cooling the towers, the boiling points of the heavier fractions are reduced.
  - d. By reducing the pressure in the towers, the boiling point of the heavier fractions are reduced.
6. From 1 Barrel of crude oil (42 gallons) a refinery will:
  - a. Recover a smaller volume of products
  - b. Recover a larger volume of products
  - c. Recover exactly the same volume as is put into the process
  - d. Lose roughly half the volume through evaporation.

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7. What does VLCC stand for?
  - a. Very Large Crude Carrier
  - b. Very Long Crude Carrier
  - c. Vertically Linear Crude Carrier
  - d. Very Little Crude Carrier
8. Inert gas systems usually use:
  - a. Clean gases from the atmosphere
  - b. Dirty gases from the exhaust stacks
  - c. Nasty gases from the lower bowels
  - d. None of the above
9. A scrubber is a water chamber that cools and removes soot and other soluble impurities.
  - a. True
  - b. False
10. Tank Cleaning can be done either by:
  - a. Crude oil washing
  - b. Water washing
  - c. None of the above
  - d. Both a and b above
11. Some portable water tank cleaning systems are called:
  - a. Butterscotch
  - b. Butterworth
  - c. Butter Pecan
  - d. None of the above
12. Crude Oil washing should never be performed on a crude carrier.
  - a. True
  - b. False
13. Which of these is not a typical pipeline system found on board a vessel?
  - a. Free Flow
  - b. Direct Line system
  - c. Double Ring Man
  - d. Double Flow system
14. Which of these is not a typical pump found on board a vessel?
  - a. Deep well Pump
  - b. Foot Pump
  - c. Centrifugal Pump
  - d. Steam Reciprocating pump
15. One reason that ballasting is done is to ensure the vessel is low enough in the water for the propeller(s) and rudder(s) to be effective.
  - a. True
  - b. False

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16. Which of these are ballast tanks?
  - a. Permanent
  - b. Dedicated
  - c. Designated
  - d. All of the above
17. The method used to perform the final stripping of tanklines at discharge is commonly referred to as:
  - a. Drip Dry
  - b. Blow Dry
  - c. Squeeze Dry
  - d. High and Dry
18. To date stainless steel is the only known tank coating suitable for all chemicals.
  - a. True
  - b. False
19. Vapor return lines allow the transfer of emissions back to the shore facility during loading.
  - a. True
  - b. False
20. When a Pressure/Vacuum Valve (PVV) is in the closed position it allows the free passage of air or vapor into and out of the tank.
  - a. True
  - b. False
21. It's important to know the last three cargoes in a tank because:
  - a. It's a U. S. customs requirement
  - b. It's a U. S. Coastguard requirement
  - c. We need to check they are compatible with the cargo to be loaded
  - d. All of the above
22. The funnel and filter are both methods of wall washing.
  - a. True
  - b. False
23. Which of the following could be classed as clients of AmSpec?
  - a. U. S. Customs
  - b. A Refiner
  - c. Trader
  - d. All of the above

3

24. A trading company will normally buy product for the purpose of fueling their shore installations and ships?
  - a. True
  - b. False
25. When working a job involving U. S. Customs, you must have your own equipment and it must be properly maintained and verified/calibrated.
  - a. True
  - b. False

Score = \_\_\_/25 = \_\_\_%

I certify that the Inspector named above has satisfactorily completed "General Industry Knowledge" (Section 9 of 9) having attained over 80%, and he/she has received additional training for any missed questions.

Manager's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspector's Signature Confirmation \_\_\_\_\_ Date \_\_\_\_\_

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