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OSHA's Refining NEP: Where Do We Stand?

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Introduction

On July 27, 2007, the U.S. Department of Labor, through the Occupational Safety and Health Administration (OSHA), issued Directive Number CPL-03-00-004, which was entitled *Petroleum Refinery Process Safety Management National Emphasis Program*. On August 18, 2009, OSHA issued a second updated Directive CPL-03-00-010 for the petroleum refining industry, replacing the initial National Emphasis Program (NEP). With the exception of some minor editing changes, the only significant change to the second Directive was to extend the time for completing inspections under the former NEP for two of OSHA's Regions – Region VI and Region VIII.

The purpose of this new, updated Directive is the same as with the initial Directive; to reduce or eliminate the workplace hazards associated with the catastrophic release of highly hazardous chemicals from petroleum refineries.

The Directive applies to all OSHA regions and contains instructions for inspecting petroleum refineries included in Standard Industrial Classification (SIC) 2911 (North American Industrial Classification System (NAICS) 324110) and contains policies and procedures to verify employers' compliance with OSHA's Process Safety Management (PSM) of Highly Hazardous Chemicals standard, 29 CFR 1910.119.

This paper will focus on several aspects of the NEP including why OSHA implemented a NEP for the petroleum refining industry, a discussion of some of the events that lead up to issuing the NEP, and a review of the latest inspection data that has resulted from inspections conducted to date.

Why a Petroleum Refining NEP?

OSHA issued the petroleum refining NEP to address the release of highly hazardous chemicals from petroleum refineries, but why? Why issue an NEP for a specific industry? Since the Process Safety Management Standard, 29 CFR 1910.119, was issued in 1992, no other industry has had more fatal and catastrophic incidents related to the release of highly hazardous chemicals than the

petroleum refining industry (SIC 2911). Table 1 below shows the number of fatalities and catastrophes for the top four SIC codes:

SIC	Description	Number of Fatalities/Catastrophes
2911	Petroleum Refining	36
2899	Chemicals and Chemical Preparations, NEC	12
2869	Industrial Organic Chemicals, NEC	12
2892	Explosives	11

Table 1. Statistical data obtained from OSHA's NEP and OSHA's website.

Since the implementation of the OSHA PSM Standard in May of 1992, there have been a total of 178 fatalities and catastrophes in general industry and, as can be seen in the Table 1 above, 36 in the petroleum refining industry. These 36 incidents included 52 employee deaths and 250 employee injuries, 98 of these injuries required hospitalization. The top four SICs account for approximately 40% of the total, while the petroleum refining industry accounts for approximately 20% of the total PSM-related fatalities and catastrophes and is greater than the other top three SICs combined.

Of the PSM-related incidents that have occurred in the petroleum refining industry, there were several incidents that precipitated the OSHA refining NEP, such as, but not necessarily limited to: the Kern Oil Refinery deadly fire and explosion in Bakersfield, CA, in January 2005, that killed one and injured two others, and the Giant Industries Ciniza Refinery fire and explosion in Jamestown, NM, in April 2004, in which four workers were seriously burned. Both of these tragic events helped lead to the petroleum refining NEP; however, there was one event that stands out and that was ultimately responsible for the OSHA refining NEP, and that was the British Petroleum America (BP) fire and explosion in Texas City, TX, in May 2005, which killed fifteen people and injured another 180. The following paragraphs will detail these three events.

The BP America Texas City Disaster

The explosion and subsequent fire at the British Petroleum Refinery in Texas City, Texas, killed 15 and injured another 180 workers, and resulted in financial losses due to OSHA citations, loss of production, and lawsuits that have, to date, exceeded several billion dollars. The incident occurred during the startup of an isomerization (ISOM) unit. During startup, the raffinate splitter tower was overfilled, resulting in pressure relief devices being opened that resulted in a flammable liquid geyser from a blowdown stack that was not equipped with a flare. The subsequent release of flammables led to a massive explosion and fire. Because the unit was in turnaround mode (i.e., shutdown for maintenance activities), there were many trailers that had been moved into the area that served as office space for personnel during the turnaround. All of the fatalities occurred in or near these office turnaround trailers that were located close to the blowdown drum. A shelter-in-place order was issued that required 43,000 townspeople to remain indoors. Some homes were damaged as far away as three-quarters of a mile from the refinery.

According the final incident report, the BP disaster was caused by organizational and safety deficiencies at all levels of the BP Corporation. Warning signs of a possible disaster were present for several years, but company officials did not intervene effectively to prevent it.

Other Refining Disasters that Lead to the Refining NEP

Kern Oil Refinery

The explosion at Kern Oil Refinery in Bakersfield, CA, resulted in the death of one worker and injury to two others. California OSHA fined Kern $80,000.00 as a result of this incident. At the time of the incident, employees were starting-up the refinery's crude unit and were isolating and cleaning a series of three pre-fractionator re-boiler pumps. While using a pressurized steam line to clean the body of one of the pumps, the workers inadvertently over-pressurized the pump casing, which subsequently catastrophically ruptured, releasing and igniting hot oil that resulted in an explosion. According to a Cal OSHA official, Kern Oil did not have proper procedures in place, and proper training was not provided for employees who were working with a dangerous piece of equipment. If procedures and training had been adequate, this disaster could have been prevented.

Giant Industries Ciniza Refinery

This particular disaster occurred as the result of the sudden release of flammable gasoline components (Alkylates) that subsequently resulted in a fire and explosion that seriously burned four workers. The release occurred as maintenance workers were removing a malfunctioning pump from the refinery's hydrofluoric acid (HF) alkylation unit. Unknown to personnel, a shut-off valve connecting the pump to a distillation column was apparently in the open position, leading to the release and subsequent fire and explosion. The Chemical Safety Board conducted a full investigation of this incident and discovered that the refinery’s mechanical integrity program was less than adequate and while addressed issues at the time of failures, did not address issues in a preventative manner. There were also breakdowns identified in the refinery’s management of change procedures as well as with the lockout/tagout program. Human factors were also identified as root causes to that contributed to this incident.

A Review of the OSHA Refining NEP Inspection Results

The scope of the refining NEP covers all petroleum refineries in the United States having the SIC of 2911. There are a total of 152 refineries of which 101 are covered by federal OSHA and 51 that are covered by state OSHA plans. The only refineries that are not included or that are exempt from this NEP are those that are part of OSHA’s Voluntary Protection Program (VPP) or in OSHA Consultation's Safety and Health Achievement Recognition Program (SHARP). Of the 101 federal OSHA-covered refineries, 20 are part of the VPP and will not be inspected.

Between June 7, 2007 and December 31, 2009, there have been 168 total inspections conducted and/or completed by federal OSHA for companies with SIC of 2911. (This statement and the following data summary are based on information that was garnered from OSHA’s website and a Freedom of Information Act (FOIA) request that was submitted to OSHA in January of 2010.) Based on the inspections that have been completed and the information obtained from the FOIA, the following Figure 1 and Tables 2 and 3 summarize the findings and citations.

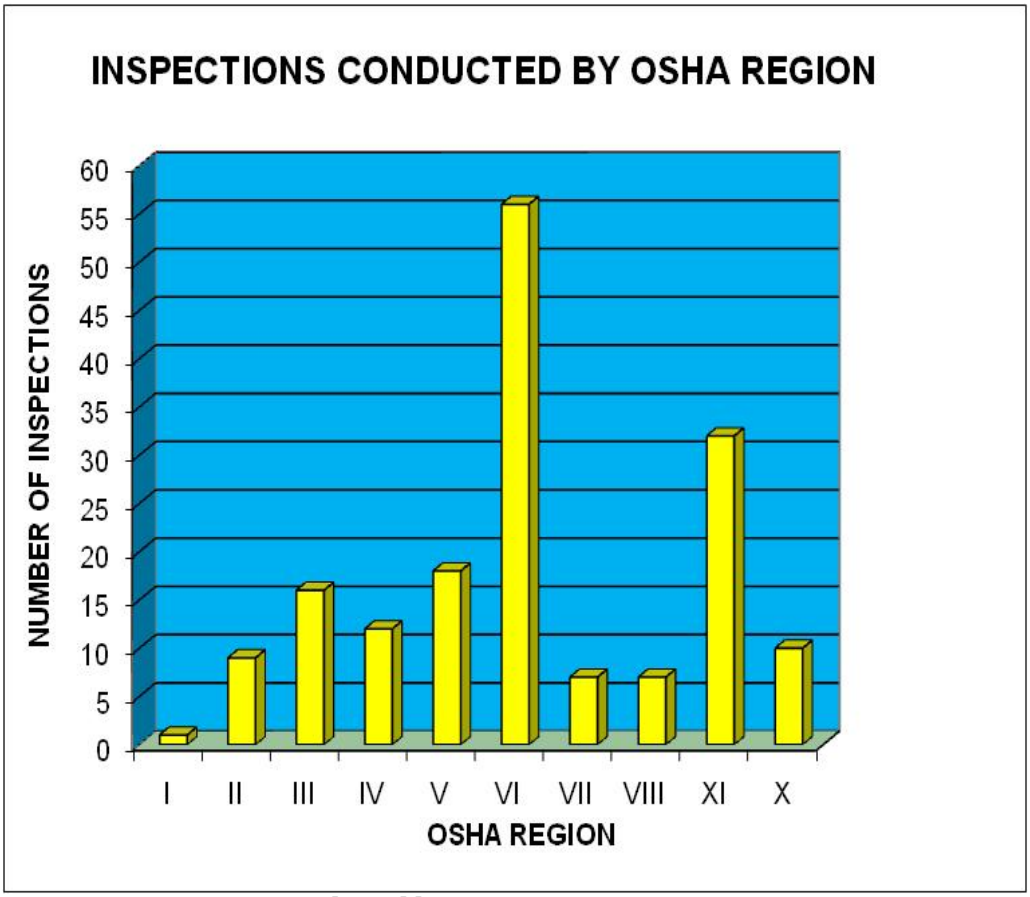

Figure 1. Inspections Conducted by OSHA Region

TYPE OF INSPECTION	NUMBER OF INSPECTIONS PER TYPE
Complaint	37
Fatality/Catastrophe	15
Follow-up	3
Monitoring	4
Other	1
Program Planned	68
Program Related	5
Referral	21
Unprogrammed Related	14
	168

Table 2. Number and Types of Inspections

VIOLATION TYPE	NUMBER OF CITATIONS PER TYPE	DOLLAR AMOUNT PER CITATION TYPE
Willful	10*	$406,000
Repeat	10	$210,200
Serious	82	$349,347
Unclassified	2	$88,000
Other	64	$42,835
*Four of the Willful citations were considered egregious.		$1,096,382

Table 3. Penalty Amounts for all Classifications of Violations

From the data obtained through the FOIA, the specific elements or paragraphs of the PSM Standard 29 CFR 1910.119 that have been cited most often are those related to paragraph (m), which is the paragraph related to incident investigations. This particular paragraph of the standard was cited 26 times. This is followed by paragraphs (j) with 21, which is mechanical integrity; paragraphs (d), (f) and (o) all with 13 which are process safety information, operating procedures and compliance audits, respectively; paragraph (l) with 11, which is management of change; and paragraph (e) with 10, which is process hazard analysis. The other paragraphs cited, i.e., (c), (g), (h) and (n), which are employee participation, training, contractors and emergency response were all below 10 citations each.

As can be seen through an analysis of the existing data, OSHA has implemented a vigorous and aggressive program to protect employees and the surrounding communities from catastrophic events that can and have resulted from the release of highly hazardous chemicals. Of all the OSHA Regions, Region VI has had more inspections than all other regions; however, this can be attributed to the fact that more refineries exist in this region than in all other regions. In addition, it is clear from the data that most of the citations to date are of a serious nature, but they do not represent the highest level of monetary penalty. That is seen in the willful or egregious citations which amount to over $400,000.