

**THIS CASE IS NOT A FINAL ORDER OF THE REVIEW COMMISSION AS IT IS PENDING  
COMMISSION REVIEW**

United States of America  
**OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION**  
1924 Building - Room 2R90, 100 Alabama Street, S.W.  
Atlanta, Georgia 30303-3104

Secretary of Labor,  
Complainant,

v.

BP Products North America, Inc., & BP-Husky  
Refining, LLC,  
Respondent,

and

United Steelworkers Local 1-346,  
Authorized Employee Representative.

OSHRC Docket No. 10-0637

Appearances:

Patrick L. DePace, Esquire, Linda Hastings, Esquire,  
U. S. Department of Labor, Office of the Solicitor, Cleveland, Ohio  
For Complainant

Jordana W. Wilson, Esquire  
U. S. Department of Labor, Office of the Solicitor, Washington, D.C.  
For Complainant

Gregory C. Dillard, Esquire, Christopher Bacon, Esquire, and Tommer Yoked, Esquire  
Vinson & Elkins, LLP, Houston, Texas  
For Respondent BP Products North America, Inc.

Felix C. Wade, Esquire  
Ice Miller, Columbus, Ohio  
For Respondent BP Husky

Kim Nibarger  
United Steelworkers, Pittsburgh, PA 15222  
For the Authorized Employee Representative

Mark Lowry

United Steelworkers, BP Toledo Refinery, Toledo, Ohio  
For the Authorized Employee Representative

Before: Administrative Law Judge Sharon D. Calhoun

### **DECISION AND ORDER**

On March 8, 2010, the Secretary issued three citations to BP Products North America, Inc. (BPP), and BP-Husky Refining, LLC (BP-Husky), alleging twenty serious, forty-two willful, and three other-than-serious violations of the Occupational Safety and Health Act of 1970 (Act), 29 U.S.C. §§ 651, *et seq.* The Secretary issued the citations following an inspection conducted by the Occupational Safety and Health Administration (OSHA) at a refinery in Oregon, Ohio. The Secretary proposed penalties totaling \$3,042,000.00 for the three citations.

BPP and BP-Husky timely contested the citations. The undersigned held a nineteen-day hearing in this matter from June 4, 2012, to June 28, 2012, in Detroit, Michigan.<sup>1</sup> The United Steelworkers Local 1-346 (Union) elected party status in this proceeding.

Prior to the hearing, the Secretary and BPP settled all items alleging serious violations in Citation No. 1 and all items alleging other-than-serious violations in Citation No. 3 (The parties submitted a written agreement to the undersigned on December 7, 2012). The Secretary agreed to withdraw Citation Nos. 1 and 3 against BP-Husky (Exh. JX-54). The undersigned approves the parties' settlement agreement, as reflected in the Order below.

The first day of the hearing, the Secretary withdrew Item 42 of Citation No. 2 (Tr. 52). In his post-hearing brief, the Secretary also withdrew Item 2b, Item 3b, and Instance (a) of Item 41 of Citation No. 2 (Secretary's brief, p. 2).

BPP and BP-Husky stipulate the Commission has jurisdiction over this proceeding under § 10(c) of the Act. BPP also stipulates it is an employer engaged in a business affecting commerce under § 3(5) of the Act. BP-Husky contends it is not an employer under § 3(5) of the Act (Tr. 23).

Remaining for disposition are Items 1 through 41 of Citation No. 2, which allege willful violations of various subsections of 29 C.F.R. § 1910.119, the Process Safety Management (PSM) standard. The Secretary proposed a penalty of \$70,000.00 for each item, for a total proposed penalty of \$2,870,000.00.

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<sup>1</sup> For the first time in a Commission proceeding, all pleadings, motions, orders, exhibits, and other documents that make up the record were filed electronically.

Item 1 of Citation No. 2 alleges a willful violation of 29 C.F.R. § 1910.119(d)(3)(i), for failing to maintain required process equipment information.

Items 2 through 27 of Citation No. 2 are grouped items. Items 2a through 27a (as well as Items 28, 29, and 30) allege willful violations of 29 C.F.R. § 1910.119(d)(3)(ii), for failing to document that equipment in the process complies with recognized and generally accepted good engineering practices. Items 4b through 27b allege willful violations of 29 C.F.R. § 1910.119(j)(5) for failing to correct deficiencies in equipment that are outside recognized and generally accepted good engineering practices.

Item 31a alleges a willful violation of 29 C.F.R. § 1910.119(d)(3)(iii) for failing to determine and document equipment is designed, maintained, inspected, tested, and operating in a safe manner. Item 31b alleges a willful violation of 29 C.F.R. § 1910.119(e)(3)(ii) for failing to identify any previous incident which had a likely potential for catastrophic consequences in the workplace.

Items 32 through 40 allege willful violations of 29 C.F.R. § 1910.119(e)(5) for failing to establish a system to promptly address the findings and recommendations of the employer's process hazard analysis team.

Item 41 alleges a willful violation of 29 C.F.R. § 1910.119(j)(4)(ii) for (in instances (b) and (c)) failing to follow recognized and generally accepted good engineering practices for the employer's inspection and testing procedures.

The Secretary, BPP, and BP-Husky submitted post-hearing briefs on February 25, 2013. The undersigned finds BP-Husky is an employer under § 3(5) of the Act. The undersigned vacates Items 1 through 12; Items 13b and 14b; Item 15; Items 16b, 17b, and 18b; and Items 19 through 41 of Citation No. 2. The undersigned affirms Items 13a, 14a, 16a, 17a, and 18a. The affirmed items are classified as serious. A penalty of \$7,000.00 is assessed for each affirmed item, for a total penalty of \$35,000.00.

### **Background**

BPP operates a refinery located at 4001 Cedar Point Road in Oregon, Ohio (Oregon is a suburb of Toledo, Ohio). BP-Husky is a joint venture with a business interest in the refinery. BPP purchased the refinery (which was built in 1919) in 1991 (Tr. 119-123).

The Ohio refinery manufactures different grades of gasoline and diesel from crude oil in its numerous process units. BPP pumps crude oil from storage tanks on the property to the different

units and refines it by boiling the crude oil and removing chemical fractions as they cool (Tr. 152, 552, 991, 1841-1842, 2039-2046, 3137).

OSHA implements a program known as the Petroleum Refinery Process Safety Management National Emphasis Program (NEP). As part of the NEP, in the second half of 2009 OSHA requested documents relating to process safety management at the Ohio refinery from BPP and BP-Husky. OSHA also reviewed reports of safety audits conducted at the refinery by consultants commissioned by BPP. OSHA then randomly selected certain pressure vessels and piping equipment, and requested documents relating to them (Tr. 692). OSHA reviewed the paperwork before inspecting the refinery.

On September 10, 2009, a team of compliance safety and health officers (CSHOs) and industrial hygienists (IHs) from OSHA began an inspection of the refinery. During the inspection, OSHA focused on the specific pressure vessels and piping equipment for which BPP provided documentation (Tr. 693). The OSHA inspection focused on three units: the Fluid Catalytic Cracker (FCC) Unit, which processes 50,000 barrels of crude oil a day, and the ALKY 1 and ALKY 2 Units, which remove sulfur from the crude oil (Tr. 695, 1736-1737, 1821, 1841-1842, 2039-2046).

### **The Middough Report**

BPP commissioned safety consultant Middough to conduct an extensive revalidation project for the refinery. The project began in 2008 and was continuing at the time of the OSHA inspection. Middough issued several draft reports as its revalidation project progressed. BPP spent more than \$6 million in engineering costs for the Middough revalidation project and more than \$10 million in equipment upgrades in response to the Middough findings (Tr. 2916).

OSHA requested copies of the Middough draft reports from BPP. BPP provided copies of the reports, including drafts issued in July, October, and December of 2009 (Exh. CX-2, CX-3; RBPP-84; Tr. 618-619). OSHA Industrial Hygienist (IH) Leonard Zielinski testified, “[W]e were told that [BPP] had a study done. We asked who the—you know, how the study was done and we came to the understanding that it was done by the Middough Report, so we asked for—we made a request for that report” (Tr. 619).

On July 28, 2000, OSHA published its *Final Policy Concerning the Occupational Safety and Health Administration’s Treatment of Voluntary Safety and Health Self-Audits*, 65 Fed. Reg. 46489 (2000). The summary of the rule states, “[OSHA’s] policy provides that the Agency will

not routinely request self-audit reports at the initiation of an inspection, and the Agency will not use self-audit reports as a means of identifying hazards upon which to focus during an inspection.” *Id.*

Although the OSHA publication is a policy and not a regulation, it provides well-reasoned guidance regarding the use of an employer’s self-auditing information. The goal of OSHA’s policy is to encourage employers to proactively address worksite safety without raising concerns they are inadvertently providing OSHA with a roadmap for issuing citations. Employers should not have to fear that self-auditing will lead to self-incrimination.

In *Solis v. Grede Wisconsin Subsidiaries*, 24 BNA OSHC 1061 (D. Wis. 2013), the court for the Western District of Wisconsin considered the Secretary’s motion to compel compliance with an administrative subpoena duces tecum he issued for internal audit documents prepared by Grede. The court denied the Secretary’s motion to compel, citing OSHA’s Final Policy on self-audits (the court provisionally granted the Secretary’s motion to compel compliance with the subpoena duces tecum “if and when OSHA discloses independently-identified hazards found at” Grede’s facility. *Id.* at 1064). Although the court’s decision in *Grede* is not precedential in this proceeding, its reasoning accords with the undersigned’s view of the issue. The court states:

Despite providing this public assurance—with the obvious goal of encouraging companies to thoroughly investigate and correct health and safety violations, thereby protecting far more workers than OSHA could hope to achieve through its own investigations alone—OSHA now takes the position that its assurance was never adopted as a rule and, therefore, in no way binds the agency. In the court’s view, however, it is irrelevant whether one calls this guidance a “rule” or merely a “final policy,” or even whether it is legally binding on the agency for purposes outside of the exercise of its agency subpoena power. What is important is that it creates a reasonable expectation of privacy that businesses rely on in conducting internal safety audits; in turn, this expectation serves OSHA’s paramount goal of promoting safety in the workplace.

*Id.* at 1063.

OSHA explicitly states in its Final Policy that OSHA “will not use self-audit reports as a means of identifying hazards upon which to focus during an inspection.” OSHA made extensive use of the Middough reports during its inspection of the refinery. In many instances, the CSHOs did not otherwise verify the self-identified deficiencies or conduct independent hazard assessments. The majority of the items at issue were self-identified by BPP and BP-Husky in documentation provided to OSHA. OSHA’s use of BPP and BP-Husky’s self-audit reports is in blatant contravention of its Final Policy. Although the undersigned is troubled by the Secretary’s

ill-advised use of the Middough reports, I am not using the Middough reports as a basis for vacating the alleged violations self-identified in the reports.

### **Is BP-Husky an Employer as Defined by § 3(5) of the Act?**

BP-Husky argues it is not an employer under § 3(5) of the Act and thus should be dismissed from this proceeding. Based upon a review of the record, the undersigned disagrees. It is determined that BP-Husky is an employer within the meaning of the Act.<sup>2</sup> BP-Husky remains a party to this case.<sup>3</sup>

## **DISCUSSION**

### **Citation No. 2**

#### **Elements of the Secretary's Burden of Proof**

To prove a violation of an OSHA standard, the Secretary must show by a preponderance of the evidence that: (1) the cited standard applies; (2) the employer failed to comply with the terms of the cited standard; (3) employees had access to the violative condition; and (4) the employer either knew or could have known with the exercise of reasonable diligence of the violative condition.

*JPC Group Inc.*, 22 BNA OSHC 1859, 1861 (No. 05-1907, 2009).

BPP and BP-Husky contend the Secretary failed to establish the elements of noncompliance, employee access, and employer knowledge for the alleged violations. They do not dispute the applicability of the cited standard.

#### **Applicability of the Cited Standard**

The PSM standard is found in *Subpart H--Hazardous Materials* of OSHA's general standards. Section 1910.119 addresses "Process safety management of highly hazardous chemicals," and states, "This section contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals. These releases may result in toxic, fire or explosion hazards."

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<sup>2</sup> At the hearing, BP-Husky moved to seal certain exhibits and certain portions of the testimony of two witnesses. The Secretary did not object to the motion, nor did BPP or the Union. The undersigned granted BP-Husky's motion. The sealed portions of the record relate to the joint venture agreement that created BP-Husky, as well as the operating services agreement between BPP and BP-Husky (Tr. 1339-1342). The Secretary and BP-Husky also redacted the sections of their briefs addressing the issue of whether BP-Husky is an employer. The parties filed unredacted copies of the briefs with the undersigned.

For purposes of review, the undersigned has attached a Sealed Appendix to this Decision and Order, discussing the analysis and rationale for concluding BP-Husky is an employer.

<sup>3</sup> BPP and BP-Husky are both cited for violations in all the remaining items at issue. BPP operated the refinery for years before BP-Husky was formed and continued afterwards to oversee its daily operation. For simplicity's sake, the undersigned will at times use "BPP" interchangeably with "BPP and BP-Husky."

Section 1910.119(a)(1)(ii) provides:

This section applies to the following:

...

(ii) A process which involves a flammable liquid or gas (as defined in 1910.1200(c) of this part) on site in one location, in a quantity of 10,000 pounds (4535.9 kg) or more[.]

George Yoksas, OSHA's area director for its Milwaukee office, testified 10,000 pounds "equate[s] to something on the order of 1,300 gallons" (Tr. 152). The refinery at issue performs a series of chemical processes, including the FCC Unit that processes 50,000 barrels of crude oil a day (Tr. 1736-1737). This quantity of crude oil (a flammable liquid) is more than sufficient to bring the refinery and its processes within the ambit of the PSM standard. BPP and BP-Husky do not dispute that the various cited subsections of the PSM standard apply to the cited conditions. ("One element is undisputed: that the cited standards apply to BPP as operator of the Refinery and as employer of the BPP workers at the site" (BPP's brief, p. 5, footnote 3).)

The Secretary has established the first element of his burden of proof for all the items at issue. The PSM standard applies to the cited conditions.

**Item 1: Alleged Willful Violation of § 1910.119(d)(3)(i)**

**Missing U-1 Form**

Item 1 of Citation No. 2 alleges:

BP-Husky Refining, LLC – Oregon, Ohio: The employer does not maintain a U-1 form for the Isobutane Recycler Coalescer (PR 511468).

Section 1910.119(d)(3)(i) provides:

[T]he employer shall complete a compilation of written process safety information before conducting any process hazard analysis required by the standard.

...

(3) *Information pertaining to the equipment in the process.* (i) Information pertaining to the equipment in the process shall include:

- (A) Materials of construction;
- (B) Piping and instrument diagrams (P&ID's);
- (C) Electrical classification;
- (D) Relief system design and design basis;
- (E) Ventilation system design;
- (F) Design codes and standards employed;
- (G) Material and energy balances for processes built after May 26, 1992; and
- (H) Safety systems (e.g. interlocks, detection or suppression systems).

## **Background**

The American Society of Mechanical Engineers (ASME) developed a form, known as a U-1 form, which pressure vessel manufacturers use to provide information to their customers (Tr. 137). After it has designed and constructed a pressure vessel, the manufacturer issues a copy of the U-1 form to the purchaser. The U-1 form contains important information relating to the safe use of the pressure vessel (Tr. 137-138, 2370).

CSHO Anthony Lowe is one of the CSHOs who inspected the Ohio refinery. He explained the importance of the U-1 form:

When we do inspections, we always ask for, if you're looking at pressure vessels, et cetera, we always ask for the U-1 report, and that's basically the birth certificate for that vessel. It talks about the maximum allowable working pressures, maximum allowable working temperatures, et cetera, on the vessel. So it's important stuff to look at to make sure that, you know, when you look at what the company is doing, that they're not exceeding those.

(Tr. 695).

OSHA requested copies of the U-1 form for five pressure vessels chosen at random (Tr. 696). OSHA also targeted pressure vessels identified by BPP's consulting company, Middough, who audited the Ohio refinery at BPP's request and issued several safety reports. OSHA reviewed the Middough reports as part of its inspection. In March 2009, Middough identified the Isobutane Recycler Coalescer (PR 511468) at issue here as not having a U-1 form available (Exh. RBPP-57; Tr. 702). During his inspection, CSHO Lowe requested a copy of the U-1 form for the Isobutane Recycler Coalescer. BPP and BP-Husky informed him they did not have a copy available (Tr. 739-740).

Steve Rowe is BPP's Safety and Operations Risk Director and the site engineering authority (Tr. 2368). Rowe acknowledged that the U-1 form at issue was missing (Tr. 2370). He contacted the National Board and requested a copy of the U-1 form. The National Board did not have a copy on file (Tr. 2376-2377).

Rowe testified that all of the information provided for a pressure vessel in a U-1 form was available at the Ohio refinery for the Isobutane Recycler Coalescer (Tr. 2391-2395). The information is found within the drawings of the pressure vessel, the bill of material on the drawings, the design code book, and the vessel's name plate. With the exception of the name plate (which is physically located on the pressure vessel) the listed items are located either

electronically or in the engineering vault in the administrative building (Exh. RBPP-14; Tr. 2390-2396, 2410-2412, 2418).

Once Rowe became aware the U-1 form for the Isobutane Recycler Coalescer was missing, he was able to locate the required information for the vessel within 30 minutes (Tr. 2420).<sup>4</sup> OSHA Area Director George Yokas and CSHO Lowe conceded the required information was available at the Ohio refinery (Tr. 169, 740).

#### *Compliance with the Terms of the Standard*

Section 1910.119(d)(3)(i) requires an employer to compile specified written PSM information for its equipment, including pressure vessels. The cited standard requires only that the written information be available—it does not specify the form the documentation should take.

Section 1910.119(d)(3)(i) does not mention the U-1 form. In fact, the U-1 form does not provide most of the information listed in § 1910.119(d)(3)(i)(A) through (H). OSHA Area Director Yoksas acknowledged the divergence between the requirements of the standard and the information provided by the U-1 form:

Q. Now the U-1 form would not include process safety information, such as piping and instrument diagrams, P&Ds, correct?

Yoksas: Correct.

Q. And it wouldn't include information about electrical classification, correct?

Yoksas: The U-1 report? Correct.

Q. And what I'm doing is I'm going through (A) through (H) in the regulations identifying which ones of those don't apply. The U-1 form won't have anything about relief systems design and design basis, correct?

Yokas: Correct.

Q. It will not have anything about ventilation system design?

Yoksas: Correct.

Q. It will not have anything about material energy balances, correct?

Yokas: Correct.

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<sup>4</sup> In his post-hearing brief, the Secretary asserts that Rowe stated that gathering the required information for the pressure vessel “could take ‘days’” (Secretary’s brief, pp. 16, 83). This is a mischaracterization of Rowe’s testimony. Rowe was referring to conducting a “fitness for service evaluation” which is performed “because components degrade over time and you need to make sure that they remain fit for service. It’s a common practice. . . [T]o do a fitness for service evaluation, depending on the nature of the damage, *it can take days to do the evaluation*” (Tr. 2419) (emphasis added). Rowe was referring to performing an evaluation, not merely locating the information.

Q. It will not have anything about safety systems, correct?

Yoksas: Correct

(Tr. 170-171).

OSHA's Area Director conceded that a U-1 form would not provide the information required for six out of the eight required specifications set out in the standard (only the materials of construction (§ 1910.119(d)(3)(i)(A)) and the design codes and standards employed (§ 191.119(d)(3)(i)(F)) are supplied by the U-1 form. *See* Exhibit RBBP-13). Despite the discrepancy between the information required by § 1910.119(d)(3)(i) and the information provided by the U-1 form, the Secretary charges in the alleged violation description (AVD) of Item 1 that BPP and BP-Husky did "not maintain a U-1 form for the Isobutane Recycler Coalescer." The AVD otherwise does not specify what information required by § 1910.119(d)(3)(i)(A) through (H) is missing.

The Secretary's flawed AVD dooms his case with respect to Item 1. By couching the alleged violation in terms of the missing U-1 form, the Secretary impermissibly creates a significant requirement not found in the cited standard. The Secretary's focus on the U-1 form is misplaced. BPP and BP-Husky cannot be found in violation of a standard for not possessing a document the cited standard does not require.

Furthermore, the record establishes BPP and BP-Husky had compiled the required information. Yoksas and CSHO Lowe conceded the information was on site. The Secretary has failed to establish BPP and BP-Husky were not in compliance with the terms of § 1910.119(d)(3)(i). Item 1 is vacated.

**Items 2 through 12: Alleged Willful Violations of §§ 1910.119(d)(3)(ii) and (j)(5)**

**IPDs<sup>5</sup> Exceeding 3%**

The AVDs of Items 2a through 12a are identical except for the identifying pressure safety valve number, the specific pressure vessel, and the IPD percentage. Items 2a through 12a follow this formula:

29 CFR 1910.119(d)(3)(ii): The employer does not document that the equipment in the process complies with recognized and generally accepted good engineering practices:

- a. BP-Husky Refining, LLC – Oregon, Ohio: The employer does not document that PSV-[identifying number] providing pressure relief protection to [specific

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<sup>5</sup> IPD refers to "Inlet Pressure Drop."

pressure vessel] complied with recognized and generally accepted good engineering practices in that it has an inlet pressure drop greater than 3%. PSV-[identifying number] was determined to have an inlet pressure drop of [ ]%.

The cited relief valves and their IPDs are:

Item 2a: PSV-134 on the Debutanizer Reflux Drum in the Alky Unit had an IPD of 3.8%;

Item 3a: PSV-137 on the First Stage Butane Treater Drum in the Alky Unit had an IPD of 4.6%;

Item 4a: PSV-447 on the Depropanizer Feed Treater Drum in the Alky Unit had an IPD of 5.4%;

Item 5a: PSV-1299 on the Cat Gas Light Oil/BFW Preheater had an IPD of 5.0%;

Item 6a: PSV-1301 on the FCC Feed Drum in the FCC Unit had an IPD of 6.3%;

Item 7a: PSV-1321 on the Fractionator Tower in the FCC Unit had an IPD of 3.2%;

Item 8a: PSV-1338A on the First Stage Drum in the FCC Unit had an IPD of 3.2%;

Item 9a: PSV-1280 on the FCC Feed Drum in the FCC Unit had an IPD of 7.7%;

Item 10a: PSV-1281 on the FCC Feed Drum in the FCC Unit had an IPD of 7.7%;

Item 11a: PSV-1332 on the Stripper Tower in the FCC Unit had an IPD of 8.8%;

Item 12a: PSV-440 on the Rerun Tower in the Alky Unit had an IPD of 6.8%.

Items 4b through 12b (the Secretary withdrew Items 2b and 3b) refer to the same pressure safety valves and IPDs identified respectively in Items 4a through 12a. The items state:

29 CFR 1910.119(j)(5): The employer does not correct deficiencies in equipment that are outside acceptable limits (as defined by process information in 29 CFR 1910.119(d) before further use or in a safe and timely manner:

a. BP-Husky Refining, LLC - Oregon, Ohio: The employer does not ensure PSV-[identifying number], located in [specific pressure vessel], has an inlet pressure drop of not more than 3%. PSV-[identifying number] was determined to have an inlet drop of [ ]%.

Items 2a through 12a allege BPP and BP-Husky violated § 1910.119(d)(3)(ii), which provides:

The employer shall document that equipment complies with recognized and generally accepted good engineering practices.

Items 2b through 12b allege BPP and BP-Husky violated § 1910.119(j)(5), which provides:

The employer shall correct deficiencies in equipment that are outside acceptable limits (defined by the process safety information in paragraph (d) of this section)

before further use or in a safe and timely manner when necessary means are taken to assure safe operation.

The disposition of these items depends upon the interpretation of the phrase “recognized and generally accepted good engineering practices,” or RAGAGEP. The Secretary argues that numerous industry consensus standards establish the RAGAGEP requires employers maintain an inlet pressure drop of no more than 3%. Because the inlet pressure drop of the cited relief valves in the refinery exceeded 3%, the Secretary contends they were mechanically deficient.

OSHA’s inspection team used the Middough report to find IPDs in excess of 3%. OSHA did not independently verify the IPDs or perform hazard assessments of the cited valves. OSHA safety engineer James Lay testified, “We evaluated the calculations that had been done by Middough against RAGAGEP and issued the citations on that basis. . . . The assumption was, if you’re not in compliance with RAGAGEP, there is potential for hazard” (Tr. 516).<sup>6</sup>

BPP and BP-Husky argue BPP has established its own RAGAGEP based on its engineering knowledge and industry experience, and that the Secretary’s 3% inlet pressure drop limit is too restrictive.

## **Background**

### *Inlet Pressure Drop (IPD)*

A pressure vessel in a refinery must have relief protection. Often this protection is provided by a relief valve, which is designed to open at its set point, remain open while pressure relieves, and close as pressure decreases to its blowdown point. Inlet pressure drop (IPD) is the amount of pressure lost due to friction as vapor or liquid passes through piping from a pressure vessel to the relief valve. IPD can be affected by numerous factors, including the length, diameter, configuration, and surface texture of the piping between the pressure vessel and the relief valve, as well as the velocity of the flow of material through the piping. The IPD is the difference between the pressure in the vessel and the pressure at the relief valve. When a vessel exceeds its maximum allowable working pressure (MAWP), it reaches the relief valve’s set point, which is the pressure at which the valve opens to relieve the overpressure. The blowdown point is the pressure at which the relief valve is set to close. The blowdown point is always less than the set point so that the valve remains open long enough to relieve pressure. The IPD is usually

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<sup>6</sup> BPP and BP-Husky objected to the testimony of James Lay before, during, and after the hearing (Tr. 238, 295-296, 470; BPP’s brief, pp. 152-160). In its post-hearing brief, BPP moves to strike Lay’s testimony on the grounds Lay provided expert testimony but was a lay witness. BPP’s motion is denied.

described as a percentage of the valve's set point. For example, if the set point for a relief valve is 100 pounds per square inch (psi) and the calculated IPD in the piping is 3 psi, then the IPD is 3% (Tr. 64, 225, 548-551, 559, 563, 2480-2483).

If an excessive IPD occurs, the relief valve may close prematurely, resulting in a condition known as "chatter" (because it sounds like teeth chattering). During chatter, the relief valve opens and closes so rapidly and violently that it can become damaged and possibly fail (Tr. 550-552, 2193).

Failure of the relief valve could result in the release (loss of containment) of hot hydrocarbons that could explode and burn, causing serious injuries or death to employees in the refinery. The relief valve is the last line of defense against an overpressure resulting in an accidental release of hazardous chemicals. By the time the relief valve is engaged, all other safety systems have failed and the pressure in the pressure vessel has risen to a dangerous level (Tr. 542-543, 552, 2877-2878). In the words of Cassandra Hamlin, the Secretary's expert in inlet pressure drop hazards, "[W]hat you're doing in an oil refinery, you're basically boiling gasoline and the only thing protecting you is the steel that keeps things in. So we use this term that sounds kind of innocuous, 'loss of containment.' Well, loss of containment means that hot gasoline, like down at BP Texas City, gets out and potentially could kill a lot of people" (Tr. 552).

#### *The PSM Standard is a Performance Standard*

The PSM Standard, § 1910.119, took effect in May 1992 as a performance standard. 57 Fed. Reg. 6390 (1991). Unlike a specification standard, which details precise requirements an employer must meet, a performance standard indicates the degree of safety and health protection required, but leaves the method of achieving the protection to the employer (Tr. 108). Compliance with a performance standard is determined by whether the employer acted as a reasonably prudent employer would:

[T]he employer is required to assess only those hazards that a "reasonably prudent employer" would recognize. *See W.G. Fairfield Co.*, 19 BNA OSHC 1233, 1235, 2000 CCH OSHD ¶ 32,216, p. 48,864 (No. 09-0344, 2000), *aff'd*, 285 F.3d 499 (6th Cir. 2002); *see also Thomas Indus. Coatings, Inc.*, 21 BNA OSHC 2283, 2287, 2004-09 CCH OSHD ¶ 32,937, p. 53,736 (No. 97-1073, 2007) ("[P]erformance standards ... are interpreted in light of what is reasonable."). A reasonably prudent employer is a reasonable person familiar with the situation, including any facts unique to the particular industry. *W.G. Fairfield Co.*, 19 BNA OSHC at 1235, 2000 CCH OSHD at pp. 48,864-65; *Farrens Tree Surgeons, Inc.*, 15 BNA OSHC 1793, 1794, 1991-93 CCH OSHD ¶ 29,770, p. 40,489 (No. 90-998, 1992); *see*

*also Brennan v. Smoke-Craft, Inc.*, 530 F.2d 843, 845 (9th Cir. 1976). Under Commission precedent, industry practice is relevant to this analysis, but it is not dispositive. *W.G. Fairfield*, 19 BNA OSHC at 1235-36, 2000 CCH OSHD at p. 48,865; *Farrens Tree Surgeons*, 15 BNA OSHC at 1794, 1991-93 CCH OSHD at p. 40,489; *see also Smoke-Craft*, 530 F.2d at 845 (noting that in absence of any industry custom the need to protect against an alleged hazard “may often be made by reference to” what a reasonably prudent employer “familiar with the industry would find necessary to protect against this hazard”).

*Associated Underwater Services*, 2012 WL 76200 at \*2 (No. 07-1851, 2012).

BPP and BP-Husky contend that OSHA is impermissibly adopting a prescriptive 3% IPD limit, in contravention of the flexibility inherent in a performance standard.

#### *RAGAGEP*

Section 1910.119(d)(3)(ii) requires an employer to document its equipment complies with “recognized and generally accepted good engineering practices,” and § 1910.119(j)(5) requires an employer to correct deficiencies in equipment that are outside acceptable limits as defined by RAGAGEP. The Secretary contends, “[T]he numerous industry consensus standards specifying an IPD of **no** more than 3% constitute applicable RAGAGEP for the process equipment at issue” (Secretary’s brief, pp. 88-89; emphasis in original). BPP and BP-Husky disagree, arguing, “BPP and other peer refineries have developed robust and well-supported relief system guidelines that justify up to 7% IPD on conventional relief valves. . . . [S]o long as the blowdown for an existing relief valve exceeds its IPD, a 5% or even 7% IPD limit for a conventional valve will not be the cause of any unstable operations or chatter” (BPP’s brief, p. 15).

#### *Industry Standards*

In 1963, the American Petroleum Institute (API) established 3% of a relief valve’s set point as the IPD limit (Tr. 2861, 2863). In December 1994, the API published its Recommended Practice 520 (RP 520) (“Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries”), amending its previous Recommended Practice by replacing the word “shall” with the word “should.” Amended RP 520 provides:

When a pressure relief valve is installed on a line directly connected to a vessel, the total non-recoverable pressure loss between the protected equipment and the pressure relief valve should not exceed 3 percent of the set pressure of the valve except as permitted in 2.2.3.1 for pilot-operated pressure relief valves. When a pressure relief valve is installed on a process line, the 3 percent limit should be applied to the sum of the loss in the normally non-flowing pressure relief valve inlet pipe and the incremental pressure loss in the process line caused by the flow through the pressure relief valve. The pressure loss should be calculated using the

rated capacity of the pressure relief valve. Pressure losses can be reduced materially by rounding the entrance to the inlet piping, by reducing the inlet line length, or by enlarging the inlet piping. Keeping the pressure loss below 3 percent becomes progressively more difficult as the orifice size of a pressure relief valve increases. . . . *An engineering analysis of the valve performance at higher inlet losses may permit increasing the allowable pressure loss above 3 percent.*

(Exh. JX-17, p.2, § 2.2.2; emphasis added).

In 2007, the ASME issued its “Boiler & Pressure Vessel Code,” (BPVC) which included “Rules for Construction of Pressure Vessels.” In its Nonmandatory Appendix M of the Rules (“Installation and Operation”), the ASME states: “[T]he flow characteristics of the upstream system shall be such that the cumulative total of all nonrecoverable inlet losses shall not exceed 3% of the valve set pressure” (Exh. JX-55, p. 593).

The Center for Chemical Process Safety (CCPS), a branch of the American Institute of Chemical Engineers (AIChE) which focuses on process safety issues in the chemical process industry, states in its 1998 “Guidelines for Pressure Relief and Effluent Handling Systems”: “The ‘3% rule’ (ASME BPVC, Appendix M) is currently acceptable as the criterion for the upper limit on inlet losses to safety relief valves” (Exh. JX-23, p.35). The CCPS acknowledges, however, that the 3% rule is a reductive approach to a complicated system:

Typically a safety valve comes from the manufacturer with its blowdown set at 7% or more. After allowing for the additional losses in the valve nozzle itself (typically about 3%), the 3% limit on inlet piping loss contains a margin of safety. Somewhat higher values of blowdown may be observed for conventional valves in service conditions of constant superimposed back pressure.

A study of the dynamic response to inlet pressure loss has been performed (Kastor 1986, 1986a, 1990, 1994). The proposed computational model is in general agreement with test results for gas flow. The study concludes that the 3% rule is an oversimplified view of the complex dynamic behavior of a valve. Chatter is not observed at higher loss in certain piping configurations, while chatter can be observed at lower loss levels in other configurations. Guidelines for piping layout and sizing based on this work are yet to be developed and accepted by rule-making bodies. Thus, the 3% rule remains as the accepted good practice.

(Exh. JX-23 at 36).

*API Study and Testimony of Cassandra Hamlin and Harold Fisher*

The API commissioned Berwanger, Inc., a consulting company specializing in oil, gas, and petrochemicals, to conduct a study on pressure relief valves (PRVs). Berwanger issued an interim report for the study in 2002. The goal of the study was to determine whether the 3% rule is “necessary and sufficient to assure against unstable operation of spring loaded PRVs and to

develop validated engineering tools (screening criteria and software) that would allow plant engineers to design and to evaluate PRV installation for stable PRV performance” (Exh. RBPP-384, p.2; Tr. 565). Berwanger surveyed seven refineries who reported they had experienced 45 loss-of-containment incidents resulting from PRV instability (Tr. 573-574).

The owner of Berwanger, Inc., (until she sold the company in 2006) and the project manager for the API study was Cassandra Hamlin (Tr. 536). Hamlin testified as an expert witness for the Secretary at the hearing. Hamlin graduated from Vanderbilt University in 1981 with a degree in engineering. She worked for five years for Exxon as a project manager (Tr. 535). She was qualified, without objection, as an expert in IPD, back pressures, the hazards associated with IPDs and back pressures, RAGAGEP, and pressure relief stability (Tr. 544-547).

Hamlin testified that, as part of the API study, she interviewed Dr. Singh, one of the lead scientists with the Electric Power Research Institute (EPRI) who investigated the partial nuclear meltdown of Three Mile Island in 1979. Dr. Singh informed Hamlin that valve chatter was a contributing factor to the partial meltdown (Tr. 581-582). After conducting a \$30,000,000.00 study to determine how best to ensure valve stability, the EPRI concluded there was no correlation that would predict whether or not a valve would become unstable:

Like us at the API, [the EPRI’s] stated goal is to come up with some type of correlation to be able to predict when and when not a valve would become unstable. Their conclusion after spending \$ 30 million was that the problem was intractable in the sense that predicting the weather is intractable. You can’t predict weather with 100% certainty because there are just too many variables. . . . In this case, the uncertainties come from—there are so many different relief valves manufactured. One variable is just how slick is the stem that, you know, the disk is sliding on? You know, it’s going to vary greatly from, is it a new relief valve? How was it machined?

So, they concluded it was not a tractable problem in the sense of being able to come up with a correlation that would predict when and when not it would occur. So, they opted, as a solution for their industry, to ensure that they would only install relief valves that they knew would operate safely.

And, what did they do? And, this is what Dr. Singh described to me, they would actually test each and every relief valve in place. They tested it in place, you know, installed in the vessel it’s protecting and it didn’t chatter, good to go.

(Tr. 582-583).

Hamlin contends that under RAGAGEP principles, an employer should only ever “install things you know or have a very high certainty are going to work,” as the EPRI did by requiring each relief valve to be tested in place (Tr. 585). Hamlin’s conclusion is that there are no

reasonable alternatives to implementing the 3% rule: “From an engineering standpoint, the burden of proof is never on somebody to have to prove that something is unsafe. In the case of the 3% rule, the only rule we have for these installations, the only one is 3%” (Tr. 585).

Hamlin was emphatic that the 3% rule is both the industry standard and the only possible RAGAGEP a reasonably prudent employer could consider with regard to a pressure relief valve:

[T]he engineering rule is very, very clear. I mean it’s been since—you know, it’s like when Moses came down off of Mount Sinai, the engineering law is going to limit the pressure to 3%[.]

(Tr. 551).

Really, the only rule that’s been around for years and years and years by every publication relevant to this topic that I’ve ever seen has been 3%.

(Tr. 560).

[The 3% rule is] totally ubiquitous in the world.

(Tr. 561).

Harold Fisher is a consultant affiliated with Balky & Associates, a company that specializes in nuclear and chemical process safety. Fisher graduated from Syracuse University in 1961 with a bachelor’s degree in chemical engineering, and later earned a master’s degree in chemical engineering and a master’s degree in engineering with industrial engineering statistics from West Virginia University. He worked as a chemical engineer for forty years with Union Carbide (Tr. 2141-2146). Since 1982, Fisher has chaired the Design Institute for Emergency Relief System (DIERS) (Tr. 2147-2148). Fisher was qualified as an expert witness in RAGAGEP’s application to pressure vessels and pressure relief systems, valve chatter, IPD, and research and literature relevant to RAGAGEP (Tr. 2164-2166).

Fisher concurs with Hamlin that the 3% rule is recognized as the standard observed by industries engaged in chemical processes (Tr. 2297). He testified, “It mentions in the ASME Boiler and Pressure Vessel Code that the inlet pressure drop would be 3% of the set pressure. And there are requirements in the code for that and that’s the expectation of the code and most of the other publications that are out there” (Tr. 2175).

*BPP and BP-Husky Argue § 1910.119(d)(3)(ii) Does Not Mandate a Maximum IDP*

BPP and BP-Husky contend that by insisting upon the 3% rule, the Secretary is impermissibly imposing a prescriptive requirement on a performance standard. The companies

argue that Secretary is selectively ignoring the parts of the industry codes that allow for higher IPDs.

For example, the API's RP 520 states that the IPD "should not exceed 3 percent of the set pressure," but goes on to say, "An engineering analysis of the valve performance at higher inlet losses may permit increasing the allowable pressure loss above 3 percent" (Exh. JX-17, p.2). The preamble to RP 520 indicates it is not the API's intent to dictate prescriptive rules: "These standards are not intended to obviate the need for applying sound engineering judgment regarding when and where standards should be utilized. The formulation and publication of API standards is not intended to inhibit anyone from using other practices" (Exh. JX-17). The API, through multiple revisions of RP 520, has continued to use the permissive "should" language with regard to the 3% rule, rather than the mandatory "shall" language (Exhs. JX-17 & 18). Furthermore, ASME's endorsement of the 3% rule for IPD is found in the *Nonmandatory* Appendix M to its "Rules for Construction of Pressure Vessels" (Exh. JX-55, p. 593) (emphasis added).

The companies point out that the industry standards endorsing the 3% rule address specifications for newly-built pressure vessels. BPP and BP-Husky assert that their new pressure vessels are built to the recommended specifications, but the industry standards are inappropriate for older pressure vessels that were in place at the refinery (built in 1919) when BPP originally bought it. OSHA safety engineer Lay agreed that valves with an IPD in excess of 3% can operate safely (Tr. 491).

BPP informed OSHA it had conducted an engineering analysis for IPD (Tr. 153). Based on its analysis, BPP developed internal IPD guidelines in a document referred to as GP 44-70, which was first implemented in April 2006 (Exh. JX-48). BPP engineer Edward Zamjec modeled GP 44-70 on API's methodology. Based on Zamjec's research, BPP originally implemented a requirement for existing relief valves to maintain an IPD of 7%, while new installations were required to follow the 3% rule (Tr. 2825). Later, BPP revised GP 44-70 to require an IPD of 5% for existing relief valves (Exh. JX-49; Tr. 158-159).

BPP and BP-Husky argue the Secretary's interpretation of § 1910.119(d)(3)(ii) denies the employer the option, as contemplated by the drafters of the standard, to develop appropriate internal standards as an alternative to following industry codes. BPP and BP-Husky assert the Secretary is establishing a bright-line test of 3% for IPD in what OSHA intended to be a performance standard.

### *Compliance with the Terms of the Standard*

OSHA's intent that § 1910.119(d)(3)(ii) be applied as a performance standard is evident in the Preamble to the final rule. The Secretary attempts to get around OSHA's intent by selectively quoting from the Preamble in his brief:

It is undisputed that the performance standards published by such respected consensus standards organizations are "recognized and generally accepted good engineering practices" under the standard. 57 Fed. Reg. 6390 ("[R]ecognized and generally accepted good engineering practices" include codes and standards published codes and standards published by NFPA, ASTM, ANSI, etc.).<sup>7</sup>

(Secretary's brief, p. 89).

This edited sentence distorts the meaning of the full sentence, which is: "The Agency believes that this phrase ["recommended and generally accepted good engineering practices"] would include appropriate internal standards of a facility, as well as codes and standards published by NFPA, ASTM, ANSI, NFPA, etc." *Id.* (emphasis added). In the full sentence, OSHA puts internal standards on an equal footing with industry codes.

In his brief, the Secretary states, "[I]t is clear from the preamble discussion of this issue that OSHA did not intend that internal standards displace applicable consensus standards," and cites to, without quoting from, 57 Fed. Reg. 6390 (1992) (Secretary's brief, p. 90). The actual language of the cited document does not support the Secretary's position.

The Preamble lays out the concerns of commenters from industries affected by the proposed PSC Standard. Commenters were leery that, instead of being suggested guidelines, the listed codes and standards would become *de facto* requirements:

Paragraph (j)(3)(ii) also contained examples of codes and standards that an employer could use to comply with the proposed provision. Many rulemaking participants disagreed with this proposed provision. . . . Some commenters were concerned that the Agency would incorporate by reference all of the codes applicable to testing and inspection such as those published by the National Fire Protection Association (NFPA), the American Society for Testing and Materials (ASTM), the American National Standards Institute (ANSI), etc. These commenters asserted that it would be difficult for an employer to obtain all such standards and decide which standards the Agency intended for them to use. They also stated that some of the standards may conflict with each other.

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<sup>7</sup> In this sentence the Preamble is addressing § 1910.119(j)(3)(ii), the inspecting and testing subsection, not the subsection at issue here § 1910.119(d)(3)(ii). In its discussion of § 1910.119(d)(3)(ii), the Preamble explicitly directs the reader to the section addressing § 1910.119(j) for an explanation of the RAGAGEP language. ("OSHA has modified this paragraph by eliminating the list of codes and standards producing organizations. The discussion in paragraph (j), mechanical integrity, discusses the reasons for this change." 57 Fed. Reg. 6375 (1992)).

Other commenters were concerned that some of the standards may be outdated and no longer applicable to their process equipment. As a result, many of these commenters suggested that the employer be permitted to use their own internal standards, or that inspection and testing procedures follow recognized and generally accepted good engineering practices.

57 Fed. Reg. 6390 (1992) (citations omitted).

The Preamble goes on to explicitly reject the position the Secretary now advocates, *i.e.*, converting suggested industry codes and standards into statutory requirements: “The codes and standards contained in proposed paragraph (j)(3)(ii) were examples of what the employer could use for inspection and testing of process equipment. *The Agency did not intend to incorporate by reference into the standard all of the codes and standards published by these consensus groups.*” *Id.* (emphasis added).

OSHA safety engineer Lay, however, testified, “We have, in this case, certainly taken the position that any inlet pressure drop exceeding the 3% value referenced in API 520 Part II, the ASME code, ISO 4126, and other published guidance documents, if you can’t document that you are in compliance with that, that’s a (d)(3)(ii) violation” (Tr. 490-491). OSHA IH Zielinski was part of OSHA’s inspection team at the refinery. When asked how OSHA concluded BPP and BP-Husky were in violation of § 1910.119(d)(3)(ii), IH Zielinski replied, “Well, we determined that by looking at the API standard” (Tr. 615).

The Preamble states that the inspection and testing subsection was revised to include the RAGAGEP language, consistent with OSHA’s intent that the subsection remain a performance standard, and not a specification standard.

This proposed provision was a performance-oriented requirement that would provide flexibility for the employer to choose the frequency which would provide the best assurance of equipment integrity.

Several rulemaking participants . . . suggested that if this provision is to be truly performance-oriented, employers should have the flexibility to follow internal standards and manufacturers’ recommendations as well as applicable codes and standards.

*OSHA agrees with these rulemaking participants. Since the phrase “recognized and generally accepted good engineering practices” would include both appropriate internal standards and applicable codes and standards, the Agency has decided to use this phrase in this provision of the final rule.*

*Id.* at 6390-6391 (citations omitted; emphasis added).

In the Preamble, OSHA explains in unmistakable terms its intent in drafting the RAGAGEP provisions of the PSM Standard. As a performance standard, § 1910.119(d)(3)(ii)

allows the employer the flexibility to achieve compliance by use of appropriate internal standards, as well as by adhering to industry codes and standards. OSHA area director Yoksas praised the flexibility the PSM Standard afforded employers: “And that’s kind of the beauty of a performance standard, that the company can come up with a variety of methodologies for which they would address those hazards under” the PSM Standard (Tr. 117). By insisting compliance with § 1910.119(d)(3)(ii) can only be achieved by following the 3% rule (which is not mandatory even under the cited codes), the Secretary has impermissibly adopted a prescriptive standard. The Secretary’s interpretation contradicts the terms of the cited standard. Area director Yoksas insisted, “[W]e do not enforce consensus standards” (Tr. 110). However, the Secretary is attempting do so here.

In the AVDs of Items 2 through 12, the Secretary does not allege BPP and BP-Husky violated the terms of §§ 1910.119(d)(3)(ii) and (j)(5) by not complying with the relevant RAGAGEP; rather, the Secretary alleges the companies violated the cited standards by allowing eleven of its pressure relief valves to exceed 3% IPD. The Secretary deliberately drafted the AVDs to incorporate the 3% rule into §§ 1910.119(d)(3)(ii) and (j)(5). In doing so, he erased the performance aspect of the RAGAGEP standards.

The Secretary is bound by the language in which he chose to frame the AVDs. Under the Secretary’s interpretation, 3% is the only possible RAGAGEP for IPDs in the refining industry. The Secretary is equating one of the terms of the standard, RAGAGEP, with the 3% rule.

Three of the cited pressure relief valves (Items 9, 10, and 11) had IPDs outside of BPP’s own original IPD limit of 7%, and three more (Items 4, 6, and 12) fell outside of BPP’s revised limit of 5%. However, the Secretary did not cite the companies for failing to comply with an alternative RAGAGEP, such as being outside acceptable limits set by BPP’s internal standards. The Secretary cited BPP and BP-Husky for exceeding 3% IPD, a prescriptive standard he impermissibly shoehorned into a performance standard. The Secretary is held to that violation description. Because the AVD improperly imposes a requirement on employers not found in the cited standards, the Secretary failed to establish BPP and BP-Husky were not in compliance with the appropriate RAGAGEP.

Items 2 through 12 are vacated.

**Items 13, 14, and 15: Alleged Willful Violations of §§ 1910.119(d)(3)(ii) and (j)(5)  
Undersized Relief Valves**

Items 13, 14, and 15 concern relief valves that were undersized. As in Items 2 through 12, the Secretary alleges BPP and BP-Husky failed to document that equipment complied with RAGAGEP (in violation of § 1910.119(d)(3)(ii) for Items 13a, 14a, and 15a), and failed to correct deficiencies in equipment outside acceptable RAGAGEP limits (in violation of § 1910.119(j)(5) for Items 13b, 14b, and 15b).

**Background**

BPP hired consultants on two different occasions in the 1990s to conduct safety reviews of the Ohio refinery. In 1990 consultant Kellog issued a relief system report and in 1998 consultant Steward and Bottomly (S&B) issued a similar report. Neither report identified a sizing deviation in connection with the cited valves (Exhs. CX-35 and RBPP-38). In June 2008, consultant Middough issued a draft report that for the first time identified the cited valves as undersized (Exh. RBPP-84; Tr. 3005, 3008). The Middough report identified PSV-115, PSV-124, and PSV-136 as being “not adequately sized for the governing scenario” (Exhs. RBPP-84, RBPP-88, and RBPP-96).

**Items 13a and 14a**

*Compliance with the Terms of the Cited Standard*

Item 13a alleges a violation of § 1910.119(d)(3)(ii), stating the employers did not document compliance with RAGAGEP by “ensuring PSV-115, located in the Alky Unit, is properly designed. PSV-115 provides protection to the Recycle Isobutane Coalescer by relieving hydrocarbons to the flare and was determined to be undersized and does not have adequate relieving rate during relief scenarios.” Item 14a alleges a violation of § 1910.119(d)(3)(ii) because BPP and BP-Husky did not document compliance with RAGAGEP by “ensuring PSV-124, located in the Alky Unit, is properly designed. PSV-124 provides protection to the Isobutane Product Coalescer by relieving hydrocarbons to the flare and was determined to be undersized and does not have an adequate relieving rate during relief scenarios.” For PSV-115, the required orifice area of the valve was 0.119 square inches. The actual size was 0.110 (Tr. 634). For PSV-124, the required orifice area was 0.114 square inches. The actual size was 0.11 square inches (Tr. 635).

BPP and BP-Husky concede these deviations, found in its own Middough report, are correct. The Secretary has established the employers failed to comply with the terms of § 1910.119(d)(3)(ii).

*Employee Access to the Violative Conditions*

Employees in the refinery were exposed to the hazards of loss of containment caused by vessel overpressure due to inadequate relieving rate. Loss of containment could expose employees to death or serious physical injury.

*Employer Knowledge*

Middough issued the draft report identifying the undersized valves in June 2008, several months prior to the commencement of OSHA's inspection. BP and BP-Husky were aware of the Middough report and thus knew of the violative condition.

Items 13a and 14a are affirmed.

**Items 13b and 14b**

*Compliance with the Terms of the Cited Standard*

Section 1910.119(j)(5) requires employers to “correct deficiencies in equipment that are outside acceptable limits. . . before further use or in a safe and timely manner when necessary means are taken to assure safe operation.” Item 13b alleges a violation of § 1910.119(j)(5), stating the employers did not correct deficiencies in the relief valves because they did “not ensure PSV-115, located in the Alky Unit, is properly designed.” Item 14b alleges a violation of § 1910.119(j)(5), for failing to “ensure PSV-124, located in the Alky Unit, is properly designed.”

Once it was alerted by the Middough report that the relief valves were undersized, BPP followed its Relief System Guidelines by verifying the calculations, analyzing the risk associated with the relief valves, and implementing interim actions that could be put in place pending a permanent solution. BPP “car-sealed”<sup>8</sup> open valves between adjoining vessels and implemented administrative controls to ensure protection was maintained (Tr. 1607-1610, 3005-3011). The implementation of these interim measures changed the risk assessment to “a very low level of concern” (Tr. 3007).<sup>9</sup>

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<sup>8</sup> To “car-seal” means to lock open a valve, ensuring that there will be an open pathway for the product to relieve through in the event of overpressure (Tr. 3050-3051).

<sup>9</sup> BPP subsequently replaced the undersized valves during turnarounds in 2011 and 2012 (Tr. 3007-3009).

Dr. Georges Melhem owns ioMosaic, a specialist firm in process safety management and relief systems (Tr. 2443). Dr. Melhem earned a Ph.D. in chemical engineering from Northeastern University (Tr. 2442). He was qualified as an expert witness at the hearing in the areas of relief valve and relief systems operation and stability in oil and gas facilities, RAGAGEP for relief valves and relief systems, and risk analysis and risk management related to risk systems (Tr. 2466).

Dr. Melhem testified that an employer is not required immediately to shut down a process or fully correct a deviation as soon as it becomes aware of an equipment deficiency. He stated:

We also discussed that these mitigants, okay, will depend on the risk level. If the risk is extremely high, you shouldn't be afforded a lot of time. You should fix them then. Shut down and fix them. Or you have to put in interim measures that will give you risk reduction until you can put [in] a permanent fix. If the technical violation or, you know, estimated to be a very low risk, very low risk exposure, the right time to do it is during a turnaround because of all the additional risks that we said would expose your employees to, if you have to do it on a one by one basis.

(Tr. 2544).

Dr. Melhem's testimony comports with the Preamble's commentary on § 1910.119(j)(5). Commenters to OSHA's proposed paragraph that became § 1910.119(j)(5) objected to the requirement that any deficiency in equipment be corrected "before further use." The Preamble notes:

It was contended that the phrase "before further use" would mean that the process would have to be shutdown, and that shutdown has its own inherent hazards. It was suggested that equipment operating beyond acceptable limits does not *always* create a serious hazard. Participants asserted that deficiencies might need to be corrected promptly, or in a time and manner to assure safe operation instead. . . . The purpose of this proposed requirement was to require equipment deficiencies to be corrected promptly if the equipment was outside the acceptable limits specified in the process safety information. The comments have convinced OSHA that there may be many situations where it may not be necessary that the deficiencies are corrected in a safe and timely manner when necessary means are taken to ensure safe operation.

57 Fed. Reg. 6391 (emphasis in original).

The Secretary does not contend BPP's interim measures to minimize the risk created by the undersized valves resulted in unsafe conditions. Section 1910.119(j)(5) did not require BPP to immediately shut down and completely correct the undersized valves before further use. It is within the parameters of the standard, as articulated in the Preamble, for the employer to take interim measures to ensure safe operation of the equipment until such time the equipment can be

corrected safely. Here, BPP took interim measures to ensure the safe operation of the deficient relief valves by car-sealing them until it could replace them entirely during a scheduled turnaround.

The Secretary has failed to establish BPP and BP-Husky violated the terms of § 1910.119(j)(5). Items 13b and 14b are vacated.

### **Items 15a and 15b**

Items 15a and 15b allege the companies violated §§ 1910.119(d)(3)(ii) and (j)(5), respectively, because PSV-136, located in the Alky Unit and providing protection to the Second Stage Butane Treater Drum, was undersized. The required orifice area for the relief valve was 0.449 square inches. The relief valve's actual orifice area was 0.307 square inches (Tr. 635).

BPP took the Second Stage Butane Treater Drum out of service in May of 2009 and drained it of hydrocarbons (Tr. 3012). The vessel remained out of service during OSHA's inspection and was still out of service at the time of the hearing (Tr. 3013).

#### Item 15a:

##### *Compliance with the Terms of the Standard*

It is undisputed PSV-136 was deficient and BPP and BP-Husky failed to document the relief valve complied with RAGAGEP. The companies failed to comply with the terms of § 1910.119(d)(3)(ii).

##### *Employee Access to the Violative Condition*

The Secretary must establish employees had access to the violative condition in order to meet his burden of proof. He fails to do so here. BPP emptied the pressure vessel and took it out of service in May of 2009, four months before OSHA began its inspection of the refinery. Thus, at the time of OSHA's inspection, the undersized relief valve did not present a hazard while installed on the empty pressure vessel. Area director Yoksas conceded there was no hazard to employees posed by PSV-136 (Tr. 191). OSHA safety engineer Lay agreed that "[i]f the piece of equipment had been properly removed from service . . . that would have been no hazard" (Tr. 464-465). Item 15a is vacated

#### Item 15b:

##### *Compliance with the Terms of the Standard*

Section 1910.119(j)(5) requires employers to correct deficiencies in equipment "before further use." In this case, after BPP took the Second Stage Butane Treater Drum out of service

(before OSHA's inspection), there was no further use of the pressure vessel. The Secretary has failed to establish BPP and BP-Husky were not in compliance with the terms of the standard. Item 15b is vacated.

**Items 16, 17, and 18: Alleged Willful Violations of § 1910.119(d)(3)(ii) and (j)(5)**

**Back Pressures Exceeded 10%**

Items 16, 17, and 18 concern relief valves (PSV-1280, PSV-1281, and PSV-1301) whose back pressures exceeded their set pressures. As in the previous sections, the Secretary alleges BPP and BP-Husky failed to document that equipment complied with RAGAGEP (in violation of § 1910.119(d)(3)(ii) for Items 16a, 17a, and 18a), and failed to correct deficiencies in equipment outside acceptable RAGAGEP limits (in violation of § 1910.119(j)(5) for Items 16b, 17b, and 18b).

**Background**

Built-up back pressure is the pressure exerted on the side of the vessel opposite to the inlet side, on the outlet piping (relief) side (Tr. 563-564, 2177, 2980). Back pressure exerts force on the valve and can operate independently or with the IPD to close the valve prematurely, raising the risk of chatter (Tr. 2188, 2193, 2521, 2523-2524).

The refinery's FCC Feed Drum receives hydrocarbons from multiple sources and then feeds them into the FCC Fractionator tower (Tr. 2982). When consultant S&B conducted its safety audit of the refinery in 1998, it discovered PSV-1280 and PSV-1281 could experience back pressure in excess of BPP's acceptable limits under certain overpressure relief scenarios (S&B did not identify a back pressure issue for PSV-1301) (Exh. RBPP-38). S&B recommended installing safety system trips to shut down the process and prevent the overpressure relief scenarios from occurring). BPP followed S&B's recommendation and installed the safety system trips in 1999 (Tr. 2976-2980).

In 2007, BPP commissioned Equity Engineering to re-evaluate the FCC Feed Drum. Equity Engineering designed a balance line between the FCC Feed Drum and the FCC Fractionator to remediate concerns related to relief system capacity. Part of this project included re-routing PSV-1301 from a blowdown drum to the flare system. Equity Engineering found no back pressure deviations. The balance line was intended to divert overpressures to the Fractionator, which could better handle them. Shortly after its installation, however, the balance line plugged, rendering it unusable (Tr. 2982-2983). BPP conducted another risk assessment for

further operation and determined there was a low risk due to the potential insufficient relief capacity for these valves. BPP implemented several interim remedial actions to ensure safe operation (Tr. 2987). At this time, BPP was unaware of back pressure deviations on PSV-1280, PSV-1281, or PSV-1301 (Tr. 1612, 1280).

In its draft report issued in July 2009, Middough identified PSV-1280, PSV-1281, and PSV-1301 as credible scenarios requiring very high relief rates (Exh. RBPP-108, RBPP-115, RBPP-126).

### **Items 16a, 17a, and 18a**

#### *Compliance with the Terms of the Standard*

Items 16a, 17a, and 18a of Citation No. 2 allege BPP and BP-Husky violated § 1910.119(d)(3)(ii) by failing to document three relief valves complied with RAGAGEP. Item 16a alleges:

BP-Husky Refining, LLC – Oregon, Ohio: The employer does not document compliance with recognized and generally accepted good engineering practices by ensuring PSV-1280, a conventional relief valve, has a back pressure of less than or equal to 10% of its set pressure. This relief device provides protection to the FCC Feed Drum, and relieves hydrocarbons to the flare.

Items 17a and 18a repeat the AVD, each with its respective relief valve identification (PSV-1281 and PSV-1301).

BPP and BP-Husky do not dispute that RAGAGEP for back pressure on conventional spring-loaded valves is generally limited to 10%. The companies concede the back pressures for the three cited relief valves exceeded 10%, as stated in the Middough report. The Middough report calculated PSV-1280 and PSV-1281 had IPDs over 7% and built-up back pressures above 50%. PSV-1301 had an IPD above 6% and a built-up back pressure above 40% (Exhs. RBPP-108, RBPP-115, RBPP-126; Tr. 332-335, 352, 359).

#### *Employee Access to the Violative Conditions*

Employees in the refinery were exposed to the hazards of loss of containment caused by excessive back pressures for the three relief valves. Loss of containment could expose employees to death or serious physical injury.

#### *Employer Knowledge*

BPP and BP-Husky received a draft of the Middough report in July of 2009. At the time of the inspection, the companies were aware the valves were not in compliance with RAGAGEP. Items 16a, 17a, and 18a are affirmed.

### **Items 16b, 17b, and 18b**

Items 16b, 17b, and 18b of Citation No. 2 allege BPP and BP-Husky violated § 1910.119(j)(5) by failing to correct deficiencies in the relief valves that were outside acceptable limits before further use or in a safe or timely manner when necessary means were taken to assure safe operation. The items allege BPP and BP-Husky did not ensure PSV-1280, PSV-1281, and PSV-1301 had back pressures of less than 10%.

Upon receipt of Middough's draft report in July of 2009, BPP implemented its Relief Systems Guidelines by verifying the accuracy of the calculations, conducting a new risk analysis, and implementing interim actions to ensure safe continued operation of the valves until permanent modifications could be completed (Tr. 2991-2992, 3002-3004). BPP added a riser to the water tanks that can feed the FCC Feed Drum to prevent and overflow of water into it. BPP also increased the management review and approval required for continued operation of the valves and the FCC Feed Drum. It also installed a full sized relief valve in an interim location that could be installed without incurring the risks associated with a shutdown of the equipment (Tr. 2987, 2992, 3053).

As noted previously, § 1910.119(j)(5) does not require an employer to immediately shut down an operation and replace a deficient piece of equipment. The standard allows an employer to take interim measures to ensure safe operation of the equipment. The Secretary has adduced no evidence that BPP and BP-Husky's interim measures failed to ensure safe operation of the equipment until the valves could be replaced during turnaround.

The Secretary has failed to establish violations of the cited standard. Items 16b, 17b, and 18b are vacated.

### **Items 19 through 27: Alleged Willful Violations of §§ 1910.119(d)(3)(ii) and (j)(5)**

#### **Pressure Relief Devices (PRDs)**

Items 19 through 27 address the lack of pressure relief devices (PRDs) on nine heat exchangers. The Secretary alleges BPP and BP-Husky failed to document equipment complied with RAGAGEP (in violation of § 1910.119(d)(3)(ii) for Items 19a through 27a) and failed to correct deficiencies in equipment outside acceptable RAGAGEP limits (in violation of § 1910.119(j)(5) for Items 19b through 27b).

## Background

The cited pressure vessels are “shell-and-tube” heat exchangers. The heat exchangers consist of the vessel itself (the “shell” side), and the tubes inside the vessel. One material moves through the vessel outside the tubes while another material moves inside the tubes, allowing the transfer of heat from one material to the other (Tr. 253-255, 1573, 1594-1595).

BPP issued its original GP 44-70 guideline in April 2006. BPP amended GP 44-70 in October 2009, implementing more restrictive requirements for its pressure relief systems (Tr. 2922-2923). In conjunction with its new guidelines, BPP had Middough analyze its heat exchangers. Middough issued a preliminary report in December 2009, toward the end of OSHA’s inspection of the refinery. The Middough report identified the nine cited heat exchangers as potentially needing additional or more direct relief protection (Exh. CX-2).

The specific heat exchangers cited are:

- Item 19: Upper Pumparound Cooler (PR543576)
- Item 20: Lower Pumparound Cooler (PR543575)<sup>10</sup>
- Item 21: Primary Absorber Lean Oil Cooler (PR543585)
- Item 22: Primary Absorber Lean Oil Cooler (PR543586)
- Item 23: Stripper Reboiler Condensate Pot (PR511134)
- Item 24: Stripper Steam Reboiler (PR543538)
- Item 25: Stripper CHGO Reboiler (PR543539)
- Item 26: Steam Slurry Generator (PR543565)
- Item 27: Cat Heavy Gas Oil Cooler (PR543567)

After BPP received the Middough report, the company performed risk assessments to determine if the heat exchangers were safe to continue operating (Tr. 3022). BPP determined the heat exchangers had open flow paths to another vessel’s relief device under normal operating procedures (Tr. 3023). The company concluded no interim measures were necessary for the two Primary Absorber Lean Oil Coolers (Items 21 and 22). BPP implemented the following interim actions for the other exchange heaters to assure safe operation:

1. Item 19: car-sealed open a pathway from the exchanger to relief protection and developed administrative procedures to drain the vessel if it became blocked in;

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<sup>10</sup> Item 20a of Citation No. 2 contains a typo, identifying the cited heat exchanger as “PR543757.” CSHO Sternes testified as to the correct identification number at the hearing (Tr. 817).

2. Item 20: installed a bypass around a control valve to piping that provided sufficient relief protection;
3. Item 23: installed an adequately sized relief valve but placed it in an interim position that could be installed without shutting down the exchanger;
4. Item 24: installed an adequately sized relief valve but placed it in a temporary position that could be installed without shutting down the exchanger;
5. Item 25: car-sealed open a pathway from the exchanger to relief protection and developed administrative procedures to drain the vessel if it became blocked in;
6. Item 26: car-sealed open a pathway from the exchanger to relief protection and developed administrative procedures to drain the vessel if it became blocked in; and
7. Item 27: car-sealed open a pathway from the exchanger to relief protection and developed administrative procedures to drain the vessel if it became blocked in.

(Tr. 3051-3053).

BPP developed action plans to permanently install relief valves during the next turnaround (Tr. 847).

### **Items 19a through 27a**

Items 19a through 27a allege:

BP-Husky Refining, LLC – Oregon, Ohio: The employer does not document the need for overpressure protection on pressure vessels as required by [RAGAGEP]. The [cited heat exchanger] is not protected by pressure relieving devices that would prevent the pressure inside the vessel from rising above acceptable limits.

#### *Compliance with the Terms of the Standard*

The Secretary has established BPP and BP-Husky failed to document compliance with RAGAGEP for the heat exchangers cited in Items 19a through 27a. Both industry consensus standards and BPP's GP 44-70 required PRDs on heat exchangers.

#### *Employee Access to the Violative Conditions*

Employees in the refinery were exposed to the hazards of loss of containment caused by the missing PRDs on the heat exchangers. Loss of containment could expose employees to death or serious physical injury. Without proper PRDs, the piping could rupture, releasing hydrocarbons into the atmosphere (Tr. 825).

### *Employee Knowledge*

CSHO Justin Sternes conducted OSHA's inspection with regard to the heat exchangers cited in Items 19 through 27. He testified he identified the cited heat exchangers by reviewing the December 2009 draft Middough report commissioned by BPP (Tr. 843). CSHO Sternes's inspection of the refinery began in October of 2009 (Tr. 809). He stated BPP representatives, including asset coordinator Dan Chovanec, relief systems technical authority David Hasselbach, and technical manager Tim Smith, were not aware until the December 2009 Middough report that the PRDs were missing (Tr. 812, 844). CSHO Sternes conceded he found no evidence that anyone at the Ohio refinery had any knowledge the heat exchangers lacked PRDs until December 2009 (Tr. 845).

The Secretary has failed to establish BPP or BP-Husky had actual knowledge of the violative conditions. CSHO Sternes's inspection began in October of 2009. It was not until December 2009 that BPP (and Sternes) became aware of the missing PRDs through the Middough report. There is no evidence anyone at BPP or BP-Husky was aware of the missing PRDs.

The Secretary argues BPP and BP-Husky should have known, through the exercise of reasonable diligence that the PRDs were missing. He contends that the cited pressure vessels were installed years before the PSM Standard was enacted and BPP should have detected at some point before the 2009 inspection that the cited heat exchangers lacked PRDs. CSHO Sternes agreed with Hasselbach, however, that it is difficult to discover the absence of PRDs by looking at the piping and IP&Ds (Tr. 845-846, 1598). Indeed, CSHO Sternes was at the Ohio refinery for two and a half months, five days a week, but he learned of the missing PRDs the same way BPP and BP-Husky did—by way of the December Middough report (Tr. 809, 843). The Secretary has failed to establish BPP and BP-Husky had constructive knowledge of the missing PRDs.

Items 19a through 27a are vacated.

### **Items 19b through 27b**

Items 19b through 27b allege:

BP-Husky Refining, LLC – Oregon, Ohio: The employer does not address the need for overpressure protection on pressure vessels. The [cited heat exchanger] is not protected by pressure relieving devices that would prevent the pressure inside the vessel from rising above acceptable limits.

### *Compliance with the Terms of the Standard*

After receiving the Middough report in December 2009, BPP conducted a risk analysis for each heat exchanger. It then implemented interim measures to ensure the safe operation of the heat exchangers. CSHO Sternes did not conduct an independent risk analysis. He did not dispute the effectiveness of the interim measures or challenge the company's decision to install the PVDs during the next scheduled turnaround (Tr. 846-847).

Again, § 1910.119(j)(5) does not require an employer to immediately shut down an operation and replace a deficient piece of equipment. The standard allows an employer to take interim measures to ensure safe operation of the equipment. The Secretary has adduced no evidence that BPP and BP-Husky's interim measures failed to ensure safe operation of the equipment until the PVDs could be installed during turnaround.

The Secretary has failed to establish BPP and BP-Husky were in noncompliance with the terms of the standard. Items 19b through 27b are vacated.

#### **Items 28, 29, and 30: Alleged Willful Violations of § 1910.119(d)(3)(ii)**

##### **Furnaces**

Items 28, 29, and 30 address combustion safeguards on furnaces. The Secretary alleges BPP and BP-Husky failed to document the cited furnaces complied with RAGAGEP, in violation of § 1910.119(d)(3)(ii). BPP and BP-Husky contend the cited furnaces fully complied with RAGAGEP.

##### **Background**

Refinery furnaces consist of separate fireboxes with many (from 20 to 70) burners that supply the heat required to boil crude oil. If a burner flame dies out, a vapor cloud of unburned fuel may form, creating an explosion hazard (Tr. 1650-1652). API's recommended practice for furnaces, *Instrumentation and Control Systems for Fired Heaters<sup>11</sup> and Steam Generators*, is RP 556 (Exh. JX-20). RP 556 emphasizes the importance of combustion safeguards on furnaces:

The greatest danger is from a fuel system that may fail long enough for the flame to die and then reintroduce fuel while the refractory is hot enough to ignite the fuel.

(Exh. JX-20, § 3.9).

CSHO Todd Jensen was OSHA's team leader for the Ohio refinery inspection. He earned a bachelor's degree in industrial and environmental health from Ferris State University in Big

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<sup>11</sup> RP 556 uses "heaters" and "furnaces" interchangeably (Tr. 1184).

Rapids, Michigan (Tr. 1113-1114). CSHO Jensen conducted the inspection of the three cited furnaces. He identified the furnaces by reviewing the safety self-audit report commissioned by BPP and issued in May 2009 (Exh. JX-1; Tr. 1163).

CSHO Jensen recommended citing BPP and BP-Husky for failing to document the three furnaces complied with RAGAGEP. Jensen stated:

There [was] instrumentation in the furnaces to detect various temperatures and whatever they were trying to detect in the furnace, but there was nothing that would shut the furnaces down automatically. It would require an operator to intervene with the central board to shut down a furnace or it would require an operator to detect a problem and then radio an employee in the field to go turn a valve or so forth. There was nothing that would automatically shut the furnace down.

(Tr. 1127).

### **Items 28, 29, and 30**

Items 28, 29, and 30 allege:

BP-Husky Refinery, LLC – Oregon, Ohio: The employer does not document compliance with recognized and generally accepted good engineering practices by ensuring combustion safeguards are provided on the [cited heater].

The cited heaters are the Crude Heater A + B firebox (Item 28), the Vac Tower Furnace C firebox (Item 29), and the Naphtha Treater Furnace (Item 30).

#### *Compliance with the Terms of the Standard*

The Secretary relied solely on the testimony of CSHO Jensen to establish the violations cited in Items 28, 29, and 30. CSHO Jensen testified he referred only to RP 556 when inspecting the furnaces (Tr. 1165). He treated Table 1 of RP 556 as a checklist, against which he compared the cited furnaces. Table 1 is entitled *Typical Alarms and Shutdown Initiators—Fire Heaters*. It lists 22 separate items from which employers may choose as combustion safeguards. After reviewing RP 556 (which he regarded as RAGAGEP for furnaces), CSHO Jensen determined BPP failed to comply with it because the cited heaters did not have automatic shutdown devices (Tr. 1127).

RP 556 intends for the employer to have flexibility in determining the best combustion safeguards to use depending on its particular furnaces. The Forward to RP 566 states, “Successful instrumentation depends upon a workable arrangement that incorporates the simplest systems and devices that will satisfy specified requirements” (Exh. JX-20). RPP 556’s *Protective Instrumentation Alarms and Shutdown Devices* also promotes the employer’s use of discretion to implement combustion safeguards best suited to its individual circumstances:

Because of the lack of the uniformity in the design and operation of fired heaters, each installation must be studied to determine how failures impact reliability and availability (See Table 1 for typical listing of alarms and shutdowns).

The final protective control system should be selected to make sure it cannot cause unsafe conditions and will not contribute to unnecessarily difficult start-ups or lead to nuisance shutdowns.

(Exh. JX-20, § 3.9).

RP 556 provides a list of factors to be considered before a safety instrument system is installed on a furnace:

The purpose of protective controls is to ensure safe operation, start-up, and shutdown conditions for fired heaters. How elaborate these systems need be depends on several factors, including the following:

- a. The type of process.
- b. The type and size of the heater.
- c. What fuels are fired.
- d. How reliable the fuel supply is.
- e. The type and reliability of the pilots.
- f. The operator coverage.
- g. Applicable regulations.
- h. Process hazard analysis.

(*Id.*).

Despite the directives of RP 556, CSHO Jensen testified he did not “actually look at the type of process in the Crude Unit or the Naphtha Unit when evaluating” the furnaces (Tr. 1183-1184). His grasp of the types and operations of furnaces was tenuous at times:

Q. So did you look at the type and size of furnace that was used?

Jensen: We looked at the size. Yeah. We looked at the type as well.

Q. Okay. What was the type of furnace that the crude—that’s used in the Crude Unit?

Jensen: I don’t recall what type it is.

Q. Okay. But you looked at it. At one point do you think you knew what type it was?

Jensen: Yeah, I do—yeah. Yes.

...

Q. If it’s a larger heater, how does that change what shutdown you need, or control you need?

Jensen: I’m not sure.

Q. When you’re determining what safeguards to put in, why is it important to know what type of fuel is being used?

Jensen: Because you want to know how flammable it is in case you would have a fire in the furnace.

Q. I think you always have a fire in the furnace, don't you? That's kind of the point of it.

(Tr. 1184-1186).

Edward Marszal owns a consulting company, Conexis, specializing in the design of safety instrument systems for process industries, including oil refineries. Marszal has a bachelor's degree in chemical engineering from Ohio State University, which he earned in 1992 (Tr. 3123-3124, 3171). He was qualified as an expert in the design and implementation of engineered safeguards, controls, and instruments (Tr. 3134).

Marszal reviewed BPP's combustion safeguards in the three cited furnaces. Asked his conclusion about the company's existing safeguards, Marszal replied, "[M]y opinion is that at the time the safeguards that they had in place were appropriate for the hazards, or the degree of risk that the hazards presented" (Tr. 3143).

Marszal explained that Table 1's list of alarms and shutdown indicators is "a list of different safeguards that are recommended to be considered for a typical fired heater" (Tr. 3148). It is not a list of mandatory safeguards. Marszal stated he had never recommended installing all of the alarms and shutdowns listed in Table 1 (Tr. 3148). He explained why, from a safety engineering point of view, it would not be effective to install all available safeguards:

[I]f you over-complicate the system, you run the risk of making your system too difficult to use, preventing the workers from getting their job done, then things happen like safety systems get put in bypass, because they're preventing people from getting their job done and that just makes a more hazardous situation.

(Tr. 3145-3146).

CSHO Jensen had listed the alleged deficiencies of the furnaces in his 1B worksheets, including missing sensors and other controls. Using simplified diagrams of the furnaces, Marszal identified the location of various sensors and controls on the furnaces (Tr. 3149-3165). Marszal testified the controls and instruments on each furnace at the time of the inspection permitted its safe operation. He stated, "My opinion is that at the time of the inspection, the existing system was in accordance with RAGAGEP (Tr. 3149).

Marszal took issue with CSHO Jensen's interpretation of "automatic" as used in RP 556. Jensen interpreted "automatic shutdown" to require no human intervention. If adequate safeguards had been installed on the furnaces, he stated, a computer system would take over during

an upset and bring the furnace into a safe condition independent of the control room operator. Jensen testified manual valves and operator control boards were insufficient to protect workers (Tr. 1127, 1144, 1165).

Marszal testified an automatic shutdown is one that works without human intervention at the valve. A shutdown implemented by remote control (a human operator pushing a button at a location removed from the valve) is still an automatic shutdown (Tr. 3190). Marszal stated, “[T]hey have an automated shutoff valve and what that means is that it’s actuated. You don’t need to go out to the valve and turn a crank. There’s an actuator that has air pressure on it and when you press a button, it will de-energize the circuit, de-pressure the actuator and the valve will go closed, so the valve is automatic, but it wasn’t connected to a flow transmitter or a temperature transmitter that’s automatically sending the signal for the valve to go to the closed position” (Tr. 3190-3191).

Marszal had more experience with furnace systems and demonstrated greater knowledge of their operation than Jensen did. Marszal was able to give detailed answers to the technical questions he was asked. He spoke confidently and without hesitation. Jensen, on the other hand, stumbled over some of the questions concerning RP 556 and the combustion safeguards:

Q. And what API does is it gives a wide range of potential options you are required to consider using on any specific type of furnace, right?

Jensen: I’m not sure. I’d have to read it to see if it says that or not.

Q. You don’t recall?

Jensen: I don’t recall.

Q. You’re not familiar enough with API 556 to know that?

Jensen: Right. Not that much detail.

(Tr. 1171-1172).

Q. Let me ask you to take a look at the last sentence. It says, “Purge systems may be used to prevent plugging.” Is that something that is required?

Jensen: I don’t know.

...

Q. So purge systems may be used to prevent plugging. Is that something BP Products Refinery had to have on its system? You talked about plugging earlier, right?

Jensen: Yeah. You’re talking about the “may” in that statement.

Q. Yes.

Jensen: So I don't know what the purging system is. So are you talking about the word "may"?

Q. Well, I'm asking—you talked about plugging earlier and I'm asking whether or not the refinery had to have purge systems to prevent plugging?

Jensen: I don't know. I don't know.

Q. Okay. So you don't have an opinion on whether or not guidance from "may be used" is a compliance requirement or not?

Jensen: I'm not sure.

(Tr. 1176).

Marszal's testimony regarding combustion safeguards is accorded more weight than that of CSHO Jensen. Jensen conceded he did not ask anyone at BPP if the company had analyzed the cited furnaces to determine if they had the correct controls and safeguards. Jensen conducted no analysis to determine what safeguards were present and what safeguards were appropriate for the furnace configurations (Tr. 1186-1189). Jensen did not distinguish between RP 556's use of "shall" and "should," stating that employers are required to comply with both, and he did not realize RP 556 used "heater" and "furnace" interchangeably (Tr. 1182, 1184).

The Secretary has failed to establish BPP and BP-Husky were in noncompliance with § 1910.119(d)(3)(ii) with respect to the cited furnaces. The Secretary, through CSHO Jensen, is attempting to enforce as mandatory the recommended practices found in RP 556. The Secretary also is incorrectly interpreting RP 556 to require employers to install all of the safeguards listed in Table 1, rather than to select the individual safeguards best suited to the individual furnaces. Items 28, 29, and 30 are vacated.

**Item 31: Alleged Willful Violation of §§ 1910.119(d)(3)(iii) and (e)(3)(i)**

**Cross Connections**

Item 31 alleges BPP and BP-Husky failed to document the refinery's fire water system was operating safely, in violation of § 1910.119(d)(3)(iii) (for Item 31a), and failed to analyze potential hazards posed by connections between the fire water system and the process water system, in violation of § 1910.119(e)(3)(1) (for Item 31b).

**Background**

Refineries have multiple water systems, including systems for utility purposes, for carrying water used in the process, and for firefighting (Tr. 3276). "Cross connection" means a connection between a fire water system and any other system in the plant (Tr. 3277). A cross connection

between a fire water system and a process water system poses two potential hazards: first, the fire water may be diverted for other uses and will have insufficient water pressure to effectively fight fire in an emergency situation, and second, the process water may contaminate the fire water system with hydrocarbons, thus creating a greater fire hazard (Tr. 3280-3282). The Secretary is only concerned with the hazard of cross contamination in Item 31.

BPP's "fire water system is a pressurized ring of piping throughout the facility that has sufficient quantity and quality of water available in case there's a need to fight a fire" (Tr. 3276). New refineries are built with a totally independent fire water system (Tr. 3276). The Ohio refinery, which was built in 1919, was designed with a single water circuit throughout the plant (Tr. 3277). When there is a direct connection between the fire water system and the process stream, which could have hydrocarbons in it, the process water can migrate through backflow and contaminate the fire water. Contamination of the fire water affects its foaming ability. Generating foam is the one of the most effective methods of extinguishing refinery fires (Tr. 3280-3282).

### **Items 31a and 31b**

Item 31a alleges:

BP-Husky Refining, LLC – Oregon, Ohio: The employer permits the existence of permanent connections between the plant fire water system and process systems, that can lead to the contamination of fire water supply with hydrocarbons or other process fluids, in that,

- a. In the Isocracker 2 Unit, there is a cross connection at the 6" supply water to the cooler box on the east side of the unit;
- b. In the Hydrogen Unit there are two cross connection instances on the blowdown drum;
- c. In the Sulfur Recovery Unit there are two filter backwash cross connections;
- d. In the Reformer 2 regeneration system, there is a cross connection between the quench and cooling water;
- e. There are cross connections on the discharge sides of the fire water booster pumps in the FCC Unit.

Section 1910.119(d)(3)(iii) provides:

For existing equipment designed and constructed in accordance with codes, standards, or practices that are no longer in general use, the employer shall determine and document that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.

Item 31b alleges:

BP-Husky Refining, LLC – Oregon, Ohio: The employer does not address in the process hazard analyses, the existence of permanent connections between the plant

fire water systems that could lead to the contamination of fire water supply with hydrocarbons or other process fluids, in that,

- a. In the Isocracker 2 Unit, there is a cross connection at the 6” supply water to the cooler box on the east side of the unit;
- b. In the Hydrogen Unit there are two cross connection instances on the blowdown drum;
- c. In the Sulfur Recovery Unit there are two filter backwash cross connections;
- d. In the Reformer 2 regeneration system, there is a cross connection between the quench and cooling water;
- e. There are cross connections on the discharge sides of the fire water booster pumps in the FCC Unit.

Section 1910.119(e) requires employers to perform an initial hazard analysis on covered processes. Section 1910.119(e)(3)(i) provides:

The process hazard analysis shall address:

- (i) The hazards of the process[.]

*Compliance with the Terms of the Standard*

CSHO Chad Positano recommended issuing the citation addressing BPP’s fire water system in Item 31. CSHO Positano based his recommendation primarily on BPP’s internal 2009 PSM audit, which he characterized as “a finding from BP’s internal audit group that there was evidence that some of the fire water connections potentially posed a hazard the way that they were set up” (Tr. 949-950). After the report was issued on June 3, 2009, BPP and the PSM audit team established deadlines for abatement or remedial action to resolve any issues identified in the audit. The first scheduled deadline was March 31, 2010 (Exh. JX-1; Tr. 958-959).

CSHO Positano did not perform a field inspection of the cross connections (Tr. 970). In fact, Positano testified he did not know what a cross connection looked like and he could not explain how one operated. He testified, “I couldn’t sit here and describe physically what the cross connection would entail, no” (Tr. 970). When asked if he could explain how a cross connection works in the refinery’s water system, CSHO Positano replied, “No, not at this time. I remember the explanation coming from Mr. Herman when I interviewed him during the inspection, but to be able to sit here today and explain those to you, I don’t think I would be able to do that, no” (Tr. 970-971).

CSHO Positano claimed § 1910.119(d)(3)(iii) requires BPP and BP-Husky to document that equipment is in compliance with applicable codes and standards (Tr. 965). Actually, the cited standard requires BPP and BP-Husky to “document that the equipment is designed,

maintained, inspected, tested, and operating in a safe manner.” Positano did not review the design documents for the fire water connections (Tr. 964). CSHO Positano could not identify any hazard created by any of the five cited cross connections (Tr. 973-975). For example, when asked if the Isocracker 2 Unit, identified in Instance (a) of Item 31 posed a hazard, Positano replied, “If it did, I don’t know how—if I would describe it, which hazard that might have posed, no” (Tr. 973). Area director Yoksas stated OSHA did not perform any analysis nor did it come to any conclusion “that there is in fact a credible possibility of contaminated process water to get into the fire water through the cross connection in Citation 31a” (Tr. 182).

Bradley Wolf graduated from Lehigh University in Bethlehem, Pennsylvania, in 1979 with a degree in material science. He worked for over a decade with Bagen Mckee, a major builder of refineries (Tr. 3263-3265). Wolf works as an oil refinery consultant (Tr. 3267). He was qualified as an expert in the areas of fire water systems in the refinery industry; the design, operations, and analysis of BPP’s fire water system; and risks associated with BPP’s fire water system (Tr. 3273).

Wolf inspected and photographed each of the cited areas in the field and reviewed the P&ID in December 2011, two years after the OSHA inspection occurred (Tr. 3284). The Secretary contends Wolf’s opinions are immaterial because he visited the Ohio refinery more than a year after the citations were issued. Wolf testified, however, that the conditions were the same as they were at the time of OSHA’s inspection:

You can pretty much tell if something’s been worked on. I didn’t see any new signs of any new construction or anything in the area. It all looked like—I don’t want to call it tired, old equipment. But it’s been there, been used. I was able to review the drawings and the drawings agreed with what was there.

(Tr. 3284-3285).

Wolf’s testimony is deemed material to Item 31. The Secretary presented no evidence showing the conditions had changed since the inspection. Wolf had photographs and P&IDs of each of the cited areas. The Secretary did not show the photographed areas and P&IDs differed from the areas as they existed during the inspection.

Wolf went through each of the cited instances and described how the water system worked in that area in great detail (Tr. 3283-3284, 3312-3317 (Instance (a)); 3321-3332 (Instance (b)); 3332-3338, 3409-3410 (Instance (c)); 3339-3343 (Instance (d)); 3344-3349 (Instance (e)). He testified there was no credible hazard of contamination in the cited areas (Tr. 3285). The cross

connections did not violate industry standards (Tr. 3286). Wolf saw no credible risk of reverse flow on any of the connections (Tr. 3358).

Chris Herman has worked for BPP since 1978. For the past 25 years he has been BPP's emergency response specialist, with the technical authority for all emergency response and fire protection issues in the refinery. Herman has a degree in fire science technologies and is a certified fire protection specialist with the NFPA (Tr. 3415).

Herman testified he participates in four to eight PHAs a year at the refinery, including PHAs for the fire water system (Tr. 3416-3417). He stated there was no credible risk of cross contamination in any of the cited areas (Tr. 3417).

The Secretary has failed to establish BPP and BP-Husky were in noncompliance with the terms of §§ 1910.119(d)(3)(iii) and (e)(3)(i). OSHA did not conduct an independent investigation of the alleged violation, but instead attempted to piggyback onto an internal self-audit commissioned by BPP. BPP's expert Wolf and its emergency response specialist Herman testified there was no credible risk that the fire water could be contaminated at the cited locations. Because there is no credible risk of hazard, there was no need for BPP's PHA team to address the hazards of the process.

Items 31a and 31b are vacated.

### **Items 32 through 40: Alleged Willful Violations of § 1910.119(e)(5)**

#### **Facility Siting PHA Recommendations**

In Items 32 through 40, the Secretary alleges BPP and BP-Husky failed to establish a system to assure that facility siting process hazard analysis (PHA) recommendations for nine buildings were resolved in a timely manner and that the resolution is documented, in violation of § 1910.119(e)(5).

#### **Background**

Ronald Unnerstall was BPP's Business Unit Leader (the highest position at the refinery) from 2006 to 2009. When he arrived, a facility-siting program was in place. The program consisted of an "inside-out" strategy that addressed higher risks first by focusing on buildings located nearest the process units and progressively working outward toward the perimeter of the refinery (Tr. 3627). The program reserved the highest priority for areas where employees worked around the clock and who were closest to the process units. Lower priority was given to areas where employees worked farther away from process units (Tr. 1497). The cited buildings were

part of later phases of BPP's program because they were located outside the process block (Tr. 4029).

By 2009, BPP had initiated a standardized site implementation plan (SIP) to address risks related to permanent buildings across its U. S. refineries. As part of the SIP, BPP developed a structured approach toward implementing building risk mitigation plans (Tr. 3692-3698). BPP used additional documents to provide more technical detail and prioritize their facility planning (Exhs. RBPP-12, RBPP-282, RBPP-283; Tr. 3699-3701, 4026, 4030).

Between 2001 and 2012, the refinery spent a cumulative \$69.6 million dollars on facility siting. The refinery spent \$33 million dollars on facility siting between 2006 and 2009. BPP relocated approximately 435 employees to hardened shelters and strengthened buildings as part of the facility siting plan since 2006. BPP has built 109,000 square feet of new space (Tr. 3757-3758, 4061, 4078, 4099).

#### **Items 32 through 40**

Items 32 through 40 allege:

BP-Husky Refining, LLC – Oregon, Ohio: The employer does not document the actions to be taken, develop a schedule to implement the actions, execute the actions necessary to control hazards associated with building collapse and damage to explosion overpressures to the [cited building], which could result in serious or fatal injuries to the building occupants.

The cited buildings are:

Item 32: WGI Insulators Building (PR-532430);

Item 33: Blender control room (PR-532354);

Item 34: Boiler Shop (Pr-532473);

Item 35: E&I Shop (PR-532419);

Item 36: HSEQ Building (PR-532380);

Item 37: Laboratory (PR-532490);

Item 38: Main Office Building (PR-532399/532400);

Item 39: WGI Administrative Offices (PR-532480); and

Item 40: WGI Electricians Building (PR-532416)

Section 1910.119(e)(5) provides:

The employer shall establish a system to promptly address the team's findings and recommendations; assure that the recommendations are resolved in a timely manner and that the resolution is documented; document what actions are to be taken; complete actions as soon as possible; develop a written schedule of when

these actions are to be completed; communicate the actions to operating, maintenance and other employees whose work assignments are in the process and who may be affected by the recommendations or actions.

*BPP and BP-Husky's Argument*

BPP argues its “actions were not untimely given the context of its long-term, complex, resource-intensive facility siting program and thus were not in violation of the” cited standard (BPP’s brief, p. 107). John Arendt is vice president for North American Process Industries sector for ABSG Consulting (Tr. 3877). He has a bachelor’s degree in nuclear engineering and a master’s degree in engineering (Tr. 3878). He has assisted 60 to 70 oil refineries with risk studies and facility-siting studies (Tr. 3878-3890). Arendt is responsible for the acronym RAGAGEP, used so much in this proceeding: “[W]hen I was testifying, both on behalf of [the CMA and API] and other associations, as well as myself, I got tired of saying [recognized and generally accepted good engineering practices] so many times so I coined the acronym RAGAGEP during that rulemaking” (Tr. 3897). Arendt was qualified as an expert in process hazard analysis and risk assessments, as well as auditing and evaluating facility siting in compliance with the PSM Standard (Tr. 3898-3899).

Arendt testified BPP’s facility siting program is reasonable. “Industry and probably the government considers high risk first and then lower risk to be a best practice” (Tr. 3908). Arendt stated that usually a refinery will have many buildings or processes that require some remediation. It is, therefore, customary for companies to rank the risks associated with occupied buildings and to address the higher risk buildings first (Tr. 3900). Arendt conducted a risk-based assessment of the nine buildings cited in Items 32 through 40. He used industry practice to look at the likelihood of risk and the consequence to determine whether an employee could be impacted in each of the buildings (Tr. 3925-3926). Arendt concluded that seven of the nine buildings were at such low risk that industry practice would not have required any mitigation at all (Tr. 3929). The companies described the steps taken or planned under the facility siting program for each of the cited buildings:

*Item 32: WGI Insulators Building (PR-532430)*

At the time of the inspection, approximately six employees worked in the WGI Insulators Building (Tr. 894). The start-of-shift safety meetings and breaks are located in this building. For the remainder of their shifts, the employees work in the plant (T. 4070).

BPP plans to relocate the function of this building to a warehouse after modifications are completed in 2013 (Tr. 4071, 4129). BPP implemented interim mitigation measures prior to 2008 (Exh. RBPP-274).

*Item 33: Blender control room (PR-532354)*

In 2010, the refinery relocated the blender operator to the Central Control Room. The refinery leased space outside the facility for storage of material from its existing warehouse (Tr. 4055, 4057). It also reassigned some field duties so employees could move to a location farther away from the process units (Tr. 1499-1500). The Blender Control Room was completely depopulated when its remaining workers were relocated to PODs (advanced-designed, hardened, blast-resistant buildings that can be built in or near the process units) in 2011 (Tr. 3713-3714, 4056). Prior to the depopulation, BPP implemented interim mitigation measures (Exh. RBPP-274).

*Item 34: Boiler Shop (Pr-532473)*

BPP has depopulated the Boiler Shop in stages. In 2006, approximately 99 employees worked there. At the time of the hearing approximately 30 employees remained in the Boiler Shop (Tr. 4071). BPP initially planned to move these employees to a new building located across Cedar Point Road. BPP later determined that course of action was less feasible than strengthening new buildings within the refinery or building a new building within the refinery (Tr. 1413, 1419-1420). The 2011 Baker Risk structural analysis demonstrated that it would not be feasible to strengthen the Boiler Shop (Tr. 4071-4072). BPP is currently reformulating its facility siting plan for this building and has decided to build a new building (Tr. 4072). BPP implemented interim mitigation measures prior to 2008 (Exh. RBPP-274).

*Item 35: E&I Shop (PR-532419)*

BPP implemented interim measures, such as the installation of film on the windows, in the E&I Shop prior to 2008 (Exh. RBPP-274). In early 2012, the Shop was completely depopulated. The employees that formerly worked in this building were all relocated to a new addition built onto and existing warehouse (Tr. 4120)

*Item 36: HSEQ Building (PR-532380)*

The HSEQ Building, now referred to as the HSSE Building, is on the refinery's fence line at the parking lot. The building has been fully mitigated, the walls hardened, and the windows

and doors strengthened during a major remodel (Exh. RBPP-274; Tr. 1508-1510, 4059). BPP implemented interim mitigation measures prior to 2008 (Exh. RBPP-274).

*Item 37: Laboratory (PR-532490)*

BPP was in the process of constructing a new Laboratory at the time of the inspection. The old Laboratory at issue here was depopulated in conjunction with the new Laboratory that was completed in 2010 (Tr. 1512).

*Item 38: Main Office Building (PR-532399/532400)*

BPP has depopulated the single-story portion of the main office building down to approximately 15 employees. Approximately 60 employees work in a two-story extension of the building that has been strengthened. The completion of the Refinery Operating Center has opened up additional space. BPP is in the process of relocating additional employees from the single-story portion of this building to the strengthened extension (Tr. 4074-4075).

*Item 39: WGI Administrative Offices (PR-532480)*

BPP had initially planned to transfer employees from the administrative offices to the building it planned to construct across Cedar Point Road. BPP later determined this option would take too much time and has since developed plans to relocate the remaining employees from the WGI Administrative Offices building to space BPP has created in an existing building (Tr. 1413, 1419-1420, 1426). BPP implemented interim mitigation measures prior to 2008 (Exh. RBPP-274).

*Item 40: WGI Electricians Building (PR-532416)*

This building was depopulated in conjunction with the E&I Shop. BPP implemented interim mitigation measures prior to 2008 (Exh. RBPP-274).

*Compliance with the Terms of the Standard*

The Secretary cites BPP and BP-Husky's failure to document efforts to resolve recommendations with respect to the cited buildings. Although the citation is couched in terms of failure to document the resolution of recommendations, the Secretary's primary issue with BPP and BP-Husky's facility siting PHA recommendations is that they were not resolved on the Secretary's timetable. CSHO Positano testified BPP and BP-Husky did not document the PHAs or see them "through to action" (Tr. 864). He stated, "There was no indication that a final decision had been made for the majority of the buildings that we cited as far as what action the company was planning to take to protect their employees" (Tr. 945).

Section 1910.119(e)(5) does not mandate any specific form of documentation or provide a schedule for completion. CSHO Positano conceded “there is no set schedule or time frame within our standard that says how long a company has to correct the findings themselves” (Tr. 942-94), and agreed the PSM Standard “is a performance-based standard. So the regulations allow employers to determine how to document its plan” (Tr. 981). OSHA provides no guidance for what constitutes documentation in compliance with the standard. Employers use a variety of documents to satisfy the standard’s requirements (Tr. 3933). BPP established it did have documentation of its efforts to resolve recommendations for the cited buildings (Exhs. RBBP-12, RBBP-274, RBBP-283, RBBP-284).

In his post-hearing brief, the Secretary asserts, “Timely means in this context, at most one to two years depending on the scope and complexity of the issue analyze, and the risk posed by the hazard. . . . In light of the context and the standard’s purpose to prevent catastrophes, resolution of the PHA recommendations and hazard control must be completed within the five-year PHA-revalidation cycle. . . . Regardless, BP’s failures to resolve the facility siting recommendations at issue in this case go far beyond any reasonable construction of the term ‘timely’” (Secretary’s brief, p. 132-133).

Arendt testified BPP’s facility siting program necessarily could not be completed on a tightly fixed schedule:

BP dealt with the highest risk buildings first and they fixed those, dealt with those. And then proceeded to deal with the next tier of building risks, which they used interim mitigations for until they could get a permanent solution. The permanent solutions that they put in place, some of them took time. And it takes time to be able to construct and to build a capital project, to be able to implement solutions like that. So I was okay with the strategy and I was okay with the things they were doing with those buildings.

(Tr. 3922).

Arendt stated that if an employer determines a project will take an extended time to complete, the employer should take effective interim measures to ensure the safety of its employees:

[Employers] will look at the highest risk situations first and then they will determine what needs to be done to be able to mitigate that risk. If that mitigation is something that requires capital expenditure or requires a unit to be shut down or a refinery to be shut down for other things, then they will look at what the general time frame is in order for that final mitigation to take place. If that amount of time is on the order of years for whatever the reason, then a company will look to

implement interim risk mitigation measures because it's prudent to be able to try to keep the risk as low as they can until they get to a final mitigation. The higher risk mitigation is something that is sort of embedded throughout the PSM Standard.

(Tr. 3901-3902),

The Secretary has failed to establish BPP and BP-Husky were in noncompliance with § 1910.119(e)(5). The companies had documentation of the refinery's facility siting program and the progress being made on it. The Secretary failed to show that the refinery's extensive project for building, moving, and remodeling its facility, using the inside-out strategy for risk assessment, was not done in a timely manner.

Items 32 through 40 are vacated.

**Item 41: Alleged Willful Violation of § 1910.119(j)(4)(ii)**

**Pipe Inspections**

The Secretary alleges BPP and BP-Husky failed to follow RAGAGEP by not testing specific test points on the thickness measurement locations (TMLs) and/or the condition monitoring locations (CMLs), and by not increasing the number of inspections in the ALKY 1 Unit where there was a history of thinning and leaks from exposure to sulfuric acid.

**Background**

A piping circuit is a length of pipe that is identified on isometric drawings for inspection purposes (Tr. 3433-3434). An employer periodically takes measurements of the pipe's thickness to monitor for corrosion "to make sure that any fluid stays inside the pipe" (Tr. 3440).

Dennis Layman is BPP's inspection superintendent. He is certified by API as a pressure vessel and piping inspector (Tr. 3430). Layman testified that BPP uses either ultrasonic or radiographic testing devices to measure the thickness of the pipe at various points within a TML. The test point that is lowest (thinnest) is recorded as the pipe's thickness at that TML. That measure is then compared to prior readings from the TML in order to estimate the remaining life for the pipe and to establish the next inspection date (Tr. 3440-3444).

**Item 41**

Item 41 alleges:

- b. BP-Husky Refining, LLC – Oregon, Ohio: In the FCC and Alky units, the employer does not follow RAGAGEP (recognized and generally accepted good engineering principles) when they do not conduct thorough piping inspections by failing to take thickness readings at a specific designated test point within a TML (thickness measurement location)/CML (condition monitoring location).

- c. BP-Husky Refining, LLC – Oregon, Ohio: The employer does not conduct additional piping inspections on the Alky flare header/subheader when historical inspections indicate flare header thinning and leaks.

Section 1910.119(j)(4)(ii) provides:

Inspection and testing procedures shall follow recognized and generally accepted good engineering principles.

*Compliance with the Terms of the Standard*

*Instance (b)*

CSHO Anthony Lowe recommended issuing the citation for this item. CSHO Lowe was of the opinion that RAGAGEP requires an employer to physically mark TMLs on pipes, rather than on isometric drawings, as BPP does. He believed BPP and BP-Husky were in violation of the cited standard because there were “no markings in particular on those vessels or piping. All they had was on their inspection drawings. So for accuracy sake, they really probably weren’t going to get the exact same spot each time, because there was no marking, et cetera, on the vessel or piping” (Tr. 747-748).

The Secretary cited BPP because it failed to take the thickness readings at the exact same test point (or “examination point”) within each TML, as indicated by physically marking the pipes. The Secretary’s case is based on the belief that TMLs are the same thing as test points or examination points.

The publication both the Secretary and BPP look to for guidance is API 570, *Piping Inspection Code* (Exhs. JX-13 (June 2006 version) and JX-14 (November 2009 version). Section 3.46 of the 2006 version of API 570 defines “test point” as:

An area defined by a circle having a diameter not greater than 2 inches (50 mm) for a line diameter not exceeding 10 inches (250 mm), or greater than 3 inches (75 mm) for larger lines. Thickness reading may be averaged within this area. A test point shall be within a thickness measurement location.

Section 3.46 of the 2006 version of API 570 defines “thickness measurement locations (TMLs) as:

Designated areas on piping systems where periodic inspections and thickness measurements are conducted.

By definition, a TML is not one point, but an area where “thickness measurements” (plural) are taken. API 570 establishes CSHO Lowe’s belief that test points and TMLs are the same thing is mistaken. The Secretary acknowledges this in his brief, conceding, “[T]he citation alleged the failure to test the same test points, which the Secretary agrees is not RAGAGEP”

(Secretary's brief, p. 140). Despite this concession that the AVD for Instance (b) mischaracterizes RAGAGEP, the Secretary believes he still somehow has a viable case:

Although the citation alleged the failure to test the same test points, which the Secretary agrees is not RAGAGEP, this instance addresses the concern that there was no assurance that corrosion readings would be taken sufficiently close to tests made five or ten years previously to assure an accurate picture of the piping's corrosion rate because the TMLs were not marked on uninsulated piping. Tr. at 160, 706-32, 764, 3433-34, 3440. A preponderance of the evidence establishes this violation.

(Secretary's brief, p. 140).

The Secretary's belief is mistaken. The AVD for Instance (b) imposed a requirement not found in the standard. Taking thickness readings at the exact same test point is not required by API 570, or any other publications purported to be RAGAGEP.

The Secretary has failed to establish BPP and BP-Husky were in noncompliance with the cited standard.

#### *Instance (c)*

CSHO Lowe testified there had been a leak in one circuit in the Alky flare header/subheader on August 30, 2009 (Tr. 778). BPP conducted an extended survey of the circuit the following day and took interim measures to contain the leak (Tr. 779). BPP replaced the piping in October 2009, during OSHA's inspection (Tr. 788).

The Secretary adduced no evidence showing BPP's procedures did not follow RAGAGEP. He has failed to establish BPP and BP-Husky were in noncompliance with the cited standard.

Item 41 is vacated.

#### **Willful Classification**

The Secretary classified all the items at issue in Citation No. 2 as willful.

A willful violation is one "committed with intentional, knowing or voluntary disregard for the requirements of the Act, or with plain indifference to employee safety." *Falcon Steel Co.*, 16 BNA OSHC 1179, 1181, 1993-95 CCH OSHA ¶30,059, p. 41, 330 (No. 89-2883, 1993) (consolidated); *A.P. O'Horo Co.*, 14 BNA OSHC 2004, 2012, 1991-93 C.H. OSHA ¶ 29,223, p. 39,133 (No. 85-0369, 1991). A showing of evil or malicious intent is not necessary to establish willfulness. *Anderson Excavating and Wrecking Co.*, 17 BNA OSHC 1890, 1891, n.3, 1995-97 C.H. OSHA ¶ 31,228, p. 43,788, n.3 (No. 92-3684, 1997), *aff'd* 131 F.3d 1254 (8th Cir. 1997). A willful violation is differentiated from a nonwillful violation by an employer's heightened awareness of the illegality of the conduct or conditions and by a state of mind, *i.e.*, conscious disregard or plain indifference for the safety and health of employees. *General Motors Corp., Electro-Motive Div.*, 14 BNA OSHC

2064, 2068, 1991-93 C.H. OSHA ¶ 29,240, p. 39,168 (No. 82-630, 1991)(consolidated).

*A.E. Staley Manufacturing Co.*, 19 BNA OSHC 1199, 1202 (Nos. 91-0637 & 91-0638, 2000).

OSHA's Final Policy on self-audits policy includes a "safe harbor" provision, which states:

Consistent with the prevailing law on willfulness, if an employer is responding in good faith to a violative condition discovered through a voluntary self-audit and OSHA detects the condition during an inspection, OSHA will not use the voluntary self-audit report as evidence that the violation is willful.

This policy is intended to apply when, through a voluntary self-audit, the employer learns that a violative condition exists and promptly takes diligent steps to correct the violative condition and brings itself into compliance, while providing effective interim employee protection, as necessary.

65 Fed. Reg. 46503.

The Secretary discovered all the affirmed violations in the instant case by reviewing BPP's Middough draft reports. At the time of the inspection, BPP and BP-Husky were taking steps to correct the violative conditions and were providing effective interim protection to the refinery employees.

*Items 13a and 14a:* BPP commissioned two separate safety audits in the 1990s, neither of which identified the cited relief valves as deficient. The Middough draft report issued in July 2009 served as the first notice BPP and BP-Husky had that the valves were deficient. Upon learning of the deficiencies, BPP immediately implemented interim measures to ensure the safe operation of the equipment. Indeed, in his post-hearing brief the Secretary notes the steps taken by BPP once it became aware of the undersized valves: "Upon receipt of Middough's calculations, Toledo implemented interim measures, sealing open piping leading to and from the serviced pressure vessel, and corrected the deficiencies at the next regularly scheduled equipment shutdown (or 'turnaround') in late 2011 or early 2012" (Secretary's brief, p.110). Nothing in the record indicates an intentional, knowing or voluntary disregard for the requirements of the Act or plain indifference to employee safety. BPP self-identified the valve deficiencies and then took steps to ensure safe operation of the equipment until it could replace the valves. There is no illegality of either BPP's conduct or the cited conditions, and thus no heightened awareness of illegality.

*Items 16a, 17a, and 18a:* Upon receipt of Middough's draft report in July of 2009, BPP implemented its Relief Systems Guidelines by verifying the accuracy of the calculations, conducting a new risk analysis, and implementing interim actions to ensure safe continued operation of the valves until permanent modifications could be completed (Tr. 2991-2992,

3002-3004). BPP added a riser to the water tanks that can feed the FCC Feed Drum to prevent and overflow of water into it. BPP also increased the management review and approval required for continued operation of the valves and the FCC Feed Drum. It also installed a full sized relief valve in an interim location that could be installed without incurring the risks associated with a shutdown of the equipment (Tr. 2987, 2992, 3053). There is no evidence of BPP or BP-Husky having a heightened awareness of illegality regarding the relief valves.

The undersigned determines the Secretary's classification of willfulness is not appropriate for BPP and BP-Husky's violations of § 1910.119(d)(3)(ii) and reclassifies the violations as serious.

### **Penalty Determination**

The Commission is the final arbiter of penalties in all contested cases. "In assessing penalties, section 17(j) of the OSH Act, 29 U. S. C. § 666(j), requires the Commission to give due consideration to the gravity of the violation and the employer's size, history of violation, and good faith." *Burkes Mechanical Inc.*, 21 BNA OSHC 2136, 2142 (No. 04-0475, 2007). "Gravity is a principal factor in a penalty determination and is based on the number of employees exposed, duration of exposure, likelihood of injury, and precautions taken against injury." *Siemens Energy and Automation, Inc.*, 20 BNA OSHC 2196, 2201 (No. 00-1052, 2005).

BPP employed approximately 600 employees at the Ohio refinery (Tr. 1339, 1812, 1830-1832). OSHA had previously cited BPP for violations at the Ohio refinery. BPP and BP-Husky demonstrated good faith during this proceeding.

*Items 13a and 14a of Citation No.2, § 1910.119(d)(3)(ii):* The gravity of the violation is high. BPP installed PSV-115 (Item 13a) in 1995 and PSV-124 (Item 14a) in 1999 (Exhs. RBPP-84 and RBPP-88). Refinery employees were exposed to the hazards of inadequate pressure relief for 14 years and 10 years, respectively, while working in proximity to the undersized valves. The undersigned determines a penalty of \$7,000.00 for each item is appropriate.

*Items 16a, 17a, and 18a of Citation No. 2, § 1910.119(d)(3)(ii):* The gravity of the violation is high. The in-service date of PSV-1280 and PSV-1281 (Items 16a and 17a) was 1973 (Tr. 355, 361). The in-service date of PSV-1301 (Item 18a) was 1958 (Tr. 335). Refinery employees were exposed for decades to the hazards of working in proximity to relief valves with

excessive built-up back pressure. The undersigned determines a penalty of \$7,000.00 for each item is appropriate.

### **FINDINGS OF FACT AND CONCLUSIONS OF LAW**

The foregoing decision constitutes the findings of fact and conclusions of law in accordance with Rule 52(a) of the Federal Rules of Civil Procedure.

### **ORDER**

Prior to the hearing, the Secretary and BPP settled the items cited in Citation No. 1 and Citation No. 3. The parties filed a written partial settlement agreement on December 7, 2012, incorporating these dispositions. The undersigned hereby approves the December 7, 2012, partial settlement agreement, the terms of which are set out below in the sections addressing Citation No. 1 and Citation No. 3.

#### **Citation No. 1**

Citation No. 1 contained Items 1 through 20 alleging serious violations, issued to BPP and to BP-Husky. Prior to the hearing, the Secretary and BPP entered into a settlement agreement. The Secretary agrees to withdraw all items of Citation No. 1 against BP-Husky. BPP agrees to accept as serious Items 1, 2, 3, 8, 12, 17, 18, 19, and 20 of Citation No. 1 and to pay \$5,000.00 for each item. The Secretary agrees to withdraw Items 4, 13, and 16, with remedial action to be agreed upon. The Secretary withdraws Items 5, 7, 10, and 11. Items 6, 9, 14, and 15 are classified as other than serious with abatement agreed on by the Secretary and BPP. No penalties are assessed for the items classified as other than serious (Exh. JX-54; Partial Settlement Agreement).

#### **Citation No. 2**

1. Item 1 of Citation No. 2, alleging a willful violation of 29 C.F.R. §1910.119(d)(3)(i), is vacated and no penalty is assessed;

2. Items 2a through 12a of Citation No. 2, alleging willful violations of 29 C.F.R. § 1910.119(d)(3)(ii), are vacated and no penalties are assessed;

3. Items 2b and 3b of Citation No. 2, alleging willful violations of 29 C.F.R. § 1910.119(j)(5), are withdrawn by the Secretary and no penalties are assessed;

3. Items 4b through 12b of Citation No. 2, alleging willful violations of 29 C. F. R. § 1910.119(j)(5), are vacated and no penalties are assessed;

4. Items 13a and 14a of Citation No. 2, alleging willful violations of 29 C.F.R. § 1910.119(d)(3)(ii), are affirmed as serious and a penalty of \$7000.00 each for Item 13a and Item 14a is assessed;

5. Items 13b and 14b of Citation No. 2, alleging willful violations of 29 C.F.R. § 1910.119(j)(5), are vacated and no penalties are assessed;

6. Items 15a and Item 15b of Citation No. 2, alleging willful violations of 29 C.F.R. §§ 1910.119(d)(3)(ii) and (j)(5), respectively, are vacated and no penalties are assessed;

7. Items 16a, 17a, and 18a of Citation No. 2, alleging willful violations of 29 C.F.R. § 1910.119(d)(3)(ii) are affirmed as serious and a penalty of \$7000.00 each for the items is assessed;

8. Items 16b, 17b, and 18b of Citation No. 2, alleging willful violations of § 1910.119(j)(5), are vacated and no penalties are assessed;

9. Items 19a through 27a of Citation No. 2, alleging willful violations of § 1910.119(d)(3)(ii), are vacated and no penalties are assessed;

10. Items 19b through 27b of Citation No. 2, alleging willful violations of § 1910.119(j)(5), are vacated and no penalties are assessed;

11. Items 28, 29, and 30 of Citation No. 2, alleging willful violations of § 1910.119(d)(3)(ii), are vacated and no penalties are assessed;

12. Items 31a and 31b of Citation No. 2, alleging willful violations of §§ 1910.119(d)(3)(iii) and (e)(3)(i), respectively, are vacated and no penalties are assessed;

13. Items 32 through 40 of Citation No. 2, alleging willful violations of § 1910.119(e)(5), are vacated and no penalties are assessed;

14. Item 41 of Citation No. 2, alleging a willful violation of § 1910.119(j)(4)(ii), is vacated and no penalty is assessed; and

15. Item 42 of Citation No. 2, alleging a willful violation of § 1910.119(j)(4)(iii), is withdrawn by the Secretary and no penalty is assessed.

### **Citation No. 3**

Citation No. 3 contained Items 1, 2, and 3 alleging other than serious violations, issued to BPP and BP Husky. Prior to the hearing, the Secretary and BPP entered into a settlement agreement. The Secretary agrees to withdraw all items of Citation No. 3 against BP-Husky. The Secretary agrees to withdraw Item 1 against BPP. BPP agrees to accept as other than serious

Items 2 and 3, with abatement agreed on by the Secretary and BPP. No penalties are assessed for Items 2 and 3 (Exh. JX-54).

SO ORDERED.

/s/ Sharon D. Calhoun  
SHARON D. CALHOUN  
Judge

Dated: August 12, 2013  
Atlanta, Georgia

