United States of America
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION
1120 20th Street, N.W., Ninth Floor
Washington, DC 20036-3457

SECRETARY OF LABOR, Complainant, v. LAMMON BROTHERS, LLC, Respondent.	OSHRC Docket No. 13-2028

Appearances: Paul Spanos, Esq.
U.S. Department of Labor, Office of the Solicitor, Cleveland, Ohio,
For the Complainant

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The McQuades Co., L.P.A., Swanton, Ohio,
For the Respondent

Before: William S. Coleman
Administrative Law Judge

DECISION AND ORDER

This matter arose following a fatal backover accident at a freeway-repaving project in the Columbus, Ohio area. The general contractor for the project was a company known as Shelly & Sands, Inc. The Respondent Lammon Brothers, LLC, was a concrete delivery subcontractor for the project. On July 16, 2013, a dump truck owned and operated by Lammon Brothers was backing up when it ran over and killed a Shelly & Sands employee who was on foot. The truck

was equipped with a reverse signal alarm, and the alarm was sounding at the time of the fatal accident.

Following an investigation by the Occupational Safety and Health Administration (OSHA), OSHA issued a one-item Citation and Notification of Penalty (Citation) to Lammon Brothers that alleged a serious violation of the construction industry standard at 29 C.F.R. §1926.601(b)(4)(i). Section 1926.601(b)(4) provides as follows:

> No employer shall use any motor vehicle equipment having an obstructed view to the rear unless:
> (i) the vehicle has a reverse signal alarm audible above the surrounding noise level or:
> (ii) the vehicle is backed up only when an observer signals that it is safe to do so.

The Citation alleged that Lammon Brothers violated this standard because the truck's reverse signal alarm was not "louder than the ambient noise," averring specifically as follows:

> [Lammon Brothers] operated a Kenworth dump truck that did not have an audible alarm that was louder than the ambient noise. The alarm was approximately 92 dBA at the bumper, approximately 85 dBA ten feet from the bumper, approximately 80 dBA 20 feet from the bumper, and approximately 76 dBA 30 feet from the bumper.

Lammon Brothers timely contested the Citation, and the undersigned conducted an evidentiary hearing in Columbus, Ohio on October 28, 2014.[1] The parties simultaneously filed

[1] The Secretary also issued a one-item serious citation to Shelly & Sands that alleged a violation of the same standard that Lammon Brothers is alleged to have violated. Shelly & Sands duly contested the citation, and that contested matter (No. 13-1906) was consolidated for hearing with the instant matter. However, prior to the consolidated hearing, the Secretary entered into a formal settlement agreement with Shelly & Sands in which the Secretary agreed to vacate the citation issued to Shelly & Sands. That settlement agreement was approved by order of the undersigned, which became a final order of the Commission on December 10, 2014. *See* Commission Rule 90(d), 29 C.F.R. § 2200.90(d); *Cuyahoga Valley Ry. Co. v. United Transp. Union*, 474 U.S. 3, 7-8 (1985) (holding the Occupational Safety and Health Review Commission does not have the authority to review the Secretary's decision to withdraw a citation).

post-hearing briefs-in-chief. Neither party opted to file a responsive brief. The hearing record was deemed closed on January 9, 2015. (Tr. 155).

The parties have stipulated to facts that establish the jurisdiction of the Occupational Safety and Health Review Commission (Commission) and coverage of the Occupational Safety and Health Act of 1970, 29 U.S.C. §§ 651-678 (the Act). (Resp't Answer, ¶¶ 1, 3 & 5; Stipulated Facts at ¶¶ 10 & 11).

The dispositive issues may be stated as follows:

1. Did the Secretary establish by a preponderance of the evidence that on July 16, 2013, the truck's reverse signal alarm was not compliant with § 1926.601(b)(4)(i) in that it was not "audible above the surrounding noise level"?

2. Assuming that the reverse signal alarm was not "audible above the surrounding noise level" on July 16, 2013, did the Secretary establish by a preponderance of the evidence that Lammon Brothers knew or should have known of that violative condition?

For the Secretary to prove his case, both of these questions must be answered in the affirmative. Neither is. Accordingly, the Citation must be vacated.

BACKGROUND

The Worksite and the Accident

Ohio Interstate Highway 270 (also known as Jack Nicklaus Freeway) is a beltway loop in the Columbus metropolitan area. Shelly & Sands was the general contractor for a three-year construction project that started in the summer of 2011 to repave portions of the freeway. (Tr. 124; Ex. D, p. 4). By the time of the fatal accident in July 2013, Lammon Brothers had been delivering fresh concrete to the project for over a year, since the spring of 2012. (Tr. 124). Lammon Brothers was one of a number of concrete delivery subcontractors involved in the project. (Stip. ¶¶ 13 & 14; Tr. 69, 92, 118, 124).

Because of the constantly changing location of the paving operation during the course of construction, the routes and manner by which dump trucks were to deliver fresh concrete to the highway construction site changed frequently. Consequently, every morning before deliveries of concrete started, Shelly & Sands provided oral instructions to the concrete haulers on how the delivery trucks were to gain access to, and to move within, the construction site. These oral instructions were a component of the internal traffic control plan for the day's operations. (Stip. ¶ 2; Tr. 94, 100, 130; Ex. D, p. 29).

On the day of the fatal accident, the westbound lanes of travel near exit number 5 (the Georgesville Road exit) were being repaved. (Stip. ¶ 13; Ex. C-11, p. 4). The westbound lanes were closed to public traffic, so the westbound traffic had been diverted to the eastbound lanes, which had a total of four lanes with two lanes of travel in each direction, separated by a concrete barrier about three to four feet high. (Tr. 104; Ex. C-11, p. 6). A grassy median separated the closed westbound lanes and the open eastbound lanes. The median appears to be roughly 30 feet wide (exclusive of any paved or graveled road shoulders). (*See* photos in Ex. C-11, pp. 11, 24, 48, 76).

At the time of the fatal accident, the paving crew was pouring concrete for the left shoulder, which would adjoin an existing single lane of concrete pavement. That existing single lane of concrete pavement was referred to at the hearing as the concrete "pad" or "slab." The fatal backover accident occurred on the concrete pad.

The concrete pad was about 12 feet wide, and its top surface was 13.5 inches higher than the gravelly roadbed on either side of it. (Tr. 131; Ex. D, p. 4). The concrete pad appears to have been recently laid, as evidenced by the rebar that protruded horizontally from its vertical sides at regular intervals, but by the time of the fatal accident, the concrete had cured sufficiently

to allow the dump trucks to use it as a "travel lane" to deliver concrete to the paving crew. (*See* photos at Ex. C-11, pp. 10, 19, 21, 24; Stip. ¶¶ 3, 16).

Shelly & Sands' internal traffic control plan for delivery of concrete on the day of the fatal accident was for the loaded trucks to access the worksite through a construction entrance off the westbound exit ramp for Exit 5 (which had remained open for exiting westbound public traffic). (Tr. 100, 103, 130). After entering the worksite, the loaded trucks were to continue to drive forward onto the elevated concrete pad by driving up steel plates that Shelly & Sands had placed in ramp-like fashion to connect the roadbed to the surface of the concrete pad. (Tr. 34-36, 131, 137; Ex. B, p. 2). Under the traffic control plan, the concrete pad "was designated as the dump truck travel lane," so only dump trucks that were delivering concrete were permitted to travel on it. (Stip. ¶ 3). Sometimes, dump trucks with full loads would be queued up (either on the concrete pad or near the steel ramp to access the concrete pad -- the record does not clearly reflect which) to wait their turn to deliver the fresh concrete to the paving crew. (Tr. 137).

Once on the concrete pad, trucks were to travel in reverse on the concrete pad to where the paving crew was located. After offloading the concrete, the truck would drive forward on the concrete pad to where another steel-plate ramp had been set up for the now unloaded truck to dismount. (Ex. B, pp. 3 & 6). This procedure allowed "a continuous backing process" of loaded trucks accessing the concrete pad to be in position to travel down the concrete pad in reverse to deliver the next load of concrete to the paving crew. (Tr. 70; 137).

With the concrete pad designated as the travel lane for the dump trucks (Stip. ¶ 3), workers were instructed by Shelly & Sands to "stay away from the traffic" and to walk alongside a concrete barrier that ran parallel to and about 30 feet away from the concrete pad. (Ex. D, p. 29; Ex. B, p. 1; Tr. 86-88, 132). Nevertheless, from time to time it was necessary for some

workers to traverse the concrete pad during construction operations. (Tr. 57). While there is no evidence that at the time of the accident the decedent was traversing the concrete pad out of any operational necessity, his access to the pad is certainly the most significant instance of an employee on foot accessing the concrete pad. (Stip. ¶ 16).

Delivery of fresh concrete on the day of the accident started at about 5:30 a.m. The accident occurred about 8:45 a.m. (Ex. D, p. 20). At least four Lammon Brothers dump trucks were delivering fresh concrete to the worksite that day. (Tr. 119; Ex. D., p. 18-19). The truck that struck the decedent was in the process of delivering approximately the 37th load of the day to the paving crew. About 15 different trucks from a number of different concrete haulers had delivered these 37 loads. (Tr. 39, 69, 136). With the near constant procession of delivery dump trucks and the other heavy equipment at the worksite, the sound of reverse signal alarms was ubiquitous during construction operations. (*E.g.*, Tr. 137).

The paving crew was about 1,100 feet away from the point where the truck that struck the decedent mounted the concrete pad. (Tr. 36). The truck had an obstructed view to the rear, in that the driver's view while using the side view mirrors had a blind spot that extended 270 feet behind the truck. (Tr. 36-38). There was no observer to guide the driver while moving in reverse.[2] The driver looked in his rear view mirrors and did not see anything in the truck's path to the rear. He then put the truck into reverse gear, which caused the truck's reverse signal alarm to activate and to emit the familiar high-pitched on and off beeping sounds at the rate of about

[2] An observer was positioned at the location of the paving crew to guide the truck to a stop for the unloading of the concrete. This observer was not involved in guiding the truck at the moment of the fatal accident, which happened about 800 feet away from the location of the paving crew. (Tr. 55-56).

one beep per second. (Ex. A; Ex. F, p. 6; Stip. ¶4). The driver used the truck's "high reverse" gear, and began to back up at a speed between five and seven m.p.h.[3] (Tr. 135).

The truck struck the Shelly & Sands employee about 213 feet from the point where it had started to move in reverse, and about 800 to 900 feet away from its destination at the paving crew's location. The truck came to a stop about 54 feet beyond the point of impact. (Tr. 150; Stip. ¶ 8).

The decedent was a member of Shelly & Sands' management, and he had been involved in developing the internal traffic control plan for the worksite. (Tr. 114). He was believed to have known that dump trucks were required to back up on the concrete pad to get to the paving crew. (Tr. 114). The decedent had driven his personal vehicle onto the worksite and had parked it near the point where the dump trucks were mounting the concrete pad. (Tr. 36; Ex. C-11, p. 11; Ex. D, p. 11). When the truck struck him, he was believed to have been walking toward the paving crew to deliver a finishing trowel to the crew. (Stip. ¶ 16; Tr. 113; Ex. D. p. 4).

The speaker for the reverse alarm was mounted in the center of the rear of the truck and was recessed about two feet back from the leading edge of the truck's dumping bed, at about the same height as the top of the truck's wheels. (Ex. C-11, pp. 20, 21, 69). The alarm's manufacturer rated it to emit a 97 dB sound. (Tr. at 72, 108, 121; Stip. ¶ 4). On the morning of

[3] Although the truck was capable of traveling as fast as 12 m.p.h. while in "high reverse" gear, there is no evidence that the truck involved in the accident, or any other Lammon Brothers trucks in service at the site, were being driven on the concrete pad at that top reverse speed. (Tr. 144). According to Mr. Robert Lammon, who is one of the company's owners and who was himself delivering fresh concrete to the project in a Lammon Brothers truck on the morning of the accident, the speed at which the Lammon Brothers drivers reversed down the concrete pad was about five to seven m.p.h. Mr. Lammon indicated that drivers needed to drive slower than the truck's maximum reverse speed in order to avoid inadvertently driving the truck off the elevated concrete pad, which could result in truck damage or even a rollover accident. (Tr. 135).

the accident, the driver of the truck had conducted a pre-trip inspection and had verified that the reverse alarm was functioning. (Tr. 83; Stip. ¶¶ 4 & 7).

OSHA Inspection/Investigation

Two OSHA compliance safety and health officers (CO's), one of whom was CO David Schott, were dispatched to inspect the worksite on the day of the accident, and they arrived sometime before noon. (Tr. 31, 35, 37, 72). CO Schott listened to the truck's reverse signal alarm and was concerned that it was not loud enough, so he returned to his office to retrieve a "digital impulse sound level meter" to measure the alarm's sound level. (Tr. 43). He returned to the site later that afternoon with the sound level meter, and at about 3:36 p.m. he took measurements of the alarm's sound level. (Tr. 40, 43-45, Exs. C-1 & C-8). Before taking any sound measurements, CO Schott followed established procedures in properly calibrating the sound meter. (Tr. 31, 42; Ex. C-8). He then set the instrument to its "impulse response" setting. (Tr. 107). According to the instrument's product information, its "impulse response" setting "may be selected for more rapidly varying and impulsive noise," the measurements of which "are captured and held on the display" for approximately 1.5 seconds. (Ex. C-8, p. 2).

CO Schott took four impulse sound level measurements of the reverse alarm on July 16, 2013, from four different distances while the truck remained stationary with its motor running. (Tr. 107-108). When taking the measurements, the CO held the meter in his hand and pointed it in the direction of the alarm's speaker. The four readings were:

- 92 dB measured with the CO standing at the rear bumper but to the side of the truck (not directly behind the truck), and holding the instrument in his hand while reaching his arm in the direction of the alarm's speaker,
- 85 dB at 10 feet from the rear bumper,
- 80 dB at 20 feet from the rear bumper,
- 76 dB at 30 feet from the rear bumper.

(Tr. 78, 106-107; Ex. C-1). CO Schott decided not to attempt to measure the decibel level of the ambient traffic noise at the scene at this time because he thought the traffic in the eastbound lanes was lighter than likely existed when the accident occurred at 8:45 a.m. (Tr. 45-46).

CO Schott returned to the scene of the fatal accident two weeks later on Tuesday, July 30, 2013, to conduct employee interviews. While on site, he also took sound level measurements of the ambient noise between 10:43 a.m. and 11:00 a.m., recording 66-67 dB with no traffic, 66-72 dB with traffic, 75 dB with a dump truck driving by, and 82-84 dB with tractor-trailers driving by. (Tr. 46-47; Ex. C-2).

About four weeks after the accident, on Friday, August 13, 2013, CO Schott returned to the accident site for the purpose of taking sound level measurements that he believed would be representative of the traffic noise at the time of the accident at 8:45 a.m. on Tuesday, July 16, 2013, which he described as "typical rush hour times." (Tr. 46, 48-52). A representative of Shelly & Sands accompanied the CO, and he was also taking sound level measurements with a different sound level meter. The westbound lanes of travel remained closed, but no construction activity was occurring at the scene on that day. (Ex. C-11, p. 76). CO Schott took sound level measurements from the approximate location of the fatal impact by placing the properly calibrated sound level meter on the trunk of his car and pointing it in the direction of the traffic in the eastbound lanes of travel about 50 feet away. (Tr. 67; Ex. 11, pp. 75, 76).

The CO recorded 33 impulse measurements over a period of 65 minutes, beginning at 7:55 a.m. and ending at 9:00 a.m. (Tr. 50-54; Exs. C-3, C-4). During the first 50 minutes (7:55 a.m. to 8:45 a.m.), his approach was to measure and note the ambient sound level at five-minute intervals and also to measure notable sound events, such as when a tractor-trailer passed.

During the final 15 minutes (from 8:45 a.m. to 9:00 a.m.), he measured and noted the sound level at one minute intervals. (Tr. 48-52; Exs. C-3 and C-4).

With no traffic passing in the eastbound lanes, the impulse sound level reading was 71 dB. (Tr. at 50; Ex. C-3). The sound level readings for "car traffic" were generally in the 78 to 85 dB range. (Tr. 51; Ex. C-3 & C-4).

Seven of the 33 readings were notable for tractor-trailers passing, and were generally greater than the decibel level of only automobile traffic. These seven readings were specifically as follows: 85-87 dB, 88 dB, 90 dB, 87-90 dB, 85 dB, 91 dB, and 93 dB. (Tr. 50-52; Exs. C-3 & C-4). The CO recorded some measurements as a range (e.g., 85-87 dB) to reflect fluctuations in the readings. (Tr. 110). As to the highest recorded measurement of 93 dB, the CO noted that the representative of Shelly & Sands who was accompanying him had recorded a lower sound level of 89 dB with his sound meter. (Tr. 51-52; Ex. C-4).

DISCUSSION

To prove a violation of an OSHA standard, the Secretary must establish that (1) the cited standard applies, (2) there was a failure to comply with the cited standard, (3) employees had access to the violative condition, and (4) the employer knew or could have known of the condition with the exercise of reasonable diligence. *Astra Pharma. Prods.*, 9 BNA OSHC 2126, 2129 (No. 78-6247, 1981) *aff'd in relevant part*, 681 F.2d 691 (D.C. Cir. 1980). As described below, the Secretary has failed to meet his burden on the second and fourth elements.

Elements 1 and 3: Applicability of the Standard & Employee Access to Violative Condition

The cited standard, § 1926.601, is applicable by its expressed terms to motor vehicles engaged in construction activities "that operate within an off-highway jobsite site, not open to public traffic." § 1926.601(a). The parties agree that the truck was a motor vehicle operating in

such an off-highway construction site. (Stip. ¶ 1 & ¶ 13). The cited standard was thus applicable. There is likewise no dispute that the truck had an obstructed view to the rear and thus had to be operated in conformity with § 1926.601(b)(4), which requires such motor vehicles either (i) to have a "reverse signal alarm audible above the surrounding noise level," or (ii) to be "backed up only when an observer signals it is safe to do so."

There is no contention that an observer was signaling the driver at the time of the fatal accident, so the crux of the case involves the audibility of the reverse alarm. Assuming solely for purposes of analysis that the alleged violative condition existed (i.e., that the truck's reverse alarm was not audible above the surrounding noise level), the great weight of the evidence establishes employee exposure to that condition.

To establish employee access to a violative condition, the Secretary must show either that "employees were actually exposed to the violative condition or that it is 'reasonably predictable by operational necessity or otherwise (including inadvertence), that employees have been, are, or will be in the zone of danger.'" *S&G Packaging Co.,* 19 BNA OSHC 1503, 1506 (No. 98-1107, 2001) (quoting *Fabricated Metal Prods.*, 18 BNA OSHC 1072, 1074 (No. 93-1853, 1997)). Employee entry into the zone of danger may be reasonably predictable even when it is the result of "employee carelessness or inadvertence." *H. B. Zachry Co. (Int'l)*, 8 BNA OSHC 1669, 1675 (No. 76-2617, 1980) (citations omitted).[4]

[4] Employee access may be established even though the workers with access to the violative condition are not employees of the cited employer. *U.S. v. Pitt-Des Moines, Inc.*, 168 F.3d 976, 982-83 (7th Cir. 1999) ("when an employer on a work site violates a safety regulation, it can face liability under the Act regardless of whether those exposed to the resulting danger were the employer's own employees or those of another"); *Grossman Steel & Aluminum Corp.*, 4 BNA OSHC 1185, 1188 (No. 12775, 1976) ("on a construction site, the safety of all employees can best be achieved if each employer is responsible for assuring that its own conduct does not create hazards to any employees on the site").

Here, the internal traffic control plan designated the concrete pad to be a travel lane dedicated to the use of the concrete delivery trucks. (Stip. ¶ 3). Workers traversing the site on foot had been instructed to walk alongside a concrete barrier that ran roughly parallel to the concrete pad about 30 feet away. (Tr. 86-88, 132; Ex. B, p. 1; Ex. D., p. 29). Nevertheless, from time to time during construction operations, Shelly & Sands employees traversed the concrete pad out of necessity. (Tr. 57; Ex. D., p. 34). And obviously, whether through inadvertence, carelessness, or otherwise, the decedent accessed the concrete pad while walking to deliver a tool to the paving crew. (Stip. ¶ 16; Tr. 57). The fatal accident itself establishes actual exposure to the struck-by hazard of construction vehicles with obstructed rear views backing up on the concrete pad. *See H. B. Zachry Co. (Int'l)*, 8 BNA OSHC at 1669 (finding evidence showing incentive to cross a construction site travel lane, *i.e.*, food stands and parking area, as well as evidence that a worker was in the travel lane, was sufficient to establish employee exposure "to the hazard posed by Respondent's use of trucks without reverse signal alarms or observers").

Element 2 – Failure to Comply with Standard

Even though the "circumstances of an accident may provide probative evidence of whether a standard was violated," *Williams Enters. Inc.*, 13 BNA OSHC 1249, 1252-1253 (No. 85-355, 1987), it is worth noting that an employer's duty to comply with a safety standard "is not dependent on whether a failure to comply … has or has not been the causative agent of injuries, nor is a finding of noncompliance predicated on the accuracy of a post-hoc accident analysis." *Concrete Constr. Corp.*, 4 BNA OSHC 1133, 1135 (No. 2490, 1976).

Section 1926.601(b)(4) is a "specification" standard, in that it prescribes two specific alternative methods of protecting construction workers from being struck by a motor vehicle with an obstructed view to the rear. A specification standard such as § 1926.601(b)(4) presumes

a hazard to exist if the terms of the standard are violated. *See Joseph J. Stolar Constr. Co.*, 9 BNA OSHC 2020, 2024 n.9 (No. 78-2528, 1981) (noting "when a standard prescribes specific means of enhancing employee safety, a hazard is presumed to exist if the terms of the standard are violated"). The Respondent's assertion that the cited standard is a "performance standard," which would require an employer to assess only those hazards that a "reasonably prudent employer" would recognize, is rejected. *See Assoc. Underwater Svcs.*, 24 BNA OSHC 1248, 1250 (No. 07-1851, 2012). (Resp't Br. p. 8).

In a Standards Interpretation letter dated July 23, 1979, OSHA interpreted the phrase "audible above surrounding noise level" in § 1926.601(b)(4)(i) to mean that the alarm must be "distinguishable from the surrounding noise level." (Ex. C, p. 1). An OSHA Standards Interpretation Letter issued nearly 25 years later on May 27, 2004, states that a reverse alarm is "audible above the surrounding noise level" under § 1926.601(b)(4)(i) if the alarm "provides adequate warning to workers in the path of the vehicle, and to workers walking towards the path of the vehicle in time to avoid contact."[5] (Ex. C, p. 3).

The Secretary asserts that he proved that the reverse alarm was not "audible above the surrounding noise level" because some of the decibel levels for the rush hour traffic that the CO measured on August 13, 2013 were equal to or greater than the decibel levels for the reverse alarm that the CO measured on July 16, 2013. The Secretary argues: "A simple comparison of these readings with the readings of the rush hour traffic … establishes the violation." (Sec'y Br. p. 9). The Secretary notes, for example, that 25 of the 33 traffic noise readings were at or above

[5]These Standard Interpretation letters, as published by OSHA on its website, were offered in evidence by the Respondent, and they were admitted without objection. (Respondent's Ex. C). The Secretary does not refer to these interpretations in his brief, but they are useful in informing the analysis here. *See Martin v. OSHRC* (*CF&I Steel Corp.*), 499 U.S. 144, 150 (1991) (holding the Commission must defer to the Secretary's reasonable interpretation of a standard).

80 dB, which was the decibel level for the alarm 20 feet from the truck's rear bumper as measured on July 16, 2013. Based on that evidence, the Secretary argues: "Therefore, 76% of the time, the back-up alarm would not be audible over traffic noise to an employee just twenty feet from the truck." (Sec'y Br. p. 9).

As described below, the Secretary's argument lacks evidentiary support for either (1) the stated conclusion that the alarm was not audible from a certain distance for a specified percentage of the time, or (2) the underlying presumption that the reverse alarm was not audible above the surrounding noise whenever the decibel level of the surrounding noise was equal to or greater than the decibel level of the alarm.

On August 13, 2013, the CO took 33 discrete impulse sound readings of the traffic noise over a period of 65 minutes. During the first 50 minutes (from 7:55 a.m. to 8:45 a.m.), he took sound level measurements at regular intervals of five minutes, and he recorded these measurements on a written log. Also during that first 50 minutes, he made additional measurements of noteworthy sound events, and he annotated the log accordingly, e.g., 71 dB for "no traffic," and 87-90 dB for "Swift truck." During the final 15 minutes (between 8:45 a.m. and 9:00 a.m.), he measured and noted the sound level at regular one-minute intervals, apparently without regard to whether a significant sound event was occurring (although two of these 15 readings were annotated respectively as "Carlyle truck" at 91 dB, and "Harley" at 86 dB). (Tr. 48-52; Exs. C-3 & C-4).

Of the 33 sound level measurements taken over the course of 65 minutes, the CO wrote descriptive annotations for 13 of them, as follows:

- The first three sound level measurements were annotated to reflect the location from which the measurements were taken.

- Seven measurements were annotated to describe the source of elevated sound levels (e.g., "United truck" at 90 dB).
- One measurement was annotated to indicate that it represented the decibel level with "no traffic" present (71 dB).
- One measurement was annotated to indicate that it represented the decibel level of "car traffic" (80 dB).
- One measurement was annotated to note that the CO's sound level reading was higher than the reading shown by the sound level meter being used by the Shelly & Sands representative (93 dB vs. 89 dB).

(Tr. 48-52; Exs. C-3 and C-4).

The decibel levels for the 20 measurements for which the CO made no descriptive annotation ranged from 70 dB to 86 dB -- the CO testified that "there was really nothing of note" happening when those unannotated measurements were taken. (Tr. 51; Exs. C-3 and C-4).

The CO did not continuously measure and document the sound level for the duration of the 65 minutes (3900 seconds), so there is no evidence to establish the length of time during those 3900 seconds that the ambient noise exceeded any given decibel level. Rather, the CO took 33 discrete "impulse response" readings that reflected the peak decibel level for "rapidly varying and impulsive noise." (Ex. C-8, p. 2). There is no evidence of the actual duration of the high decibel events such as a tractor-trailer passing, so it is unknown whether those higher decibel levels lasted for only a small fraction of a second or for significantly longer. (In contrast, the reverse alarm is known to sound at consistent intervals of approximately one beep per second in equal on and off pulses -- pulses that, according to one manufacturer's promotional material, sound at a "dominant frequency" (Ex. F., p. 8)).

Consequently, there is no evidence from which to calculate the percentage of time the decibel level of the ambient noise was equal to or greater than the decibel level of the alarm during the 3900 seconds that the CO measured the traffic noise on August 13, 2013. The

calculation of such a percentage requires not only the known denominator of 3900 seconds, but also a numerator representing the length of time during those 3900 seconds the traffic noise was at or above a certain decibel level. There is no evidence that would supply the required numerator for such a percentage calculation. It is thus simply not possible on this record to calculate the percentage of time that the traffic noise was at or above any given decibel level over the course of the 3900 seconds that the CO took the 33 discrete impulse sound level measurements.

Further, the presumption that underpins the Secretary's argument is that the recurrent beeping of the reverse alarm on this worksite was completely masked or washed out (i.e., not distinguishable from the surrounding noise) whenever the traffic noise was equal to or greater than the decibel level of the alarm. (Sec'y Brief, p. 9). However, the Secretary presented no evidence, whether in the form of expert testimony or otherwise, to establish this underlying presumption.[6]

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[6] To the contrary, some reference material that the CO consulted during his investigation suggests to this trier of fact, who does not possess any special knowledge on the science of sound, that a sound source may be distinguishable from the ambient noise even if that ambient noise has the same or an even higher decibel level. For example, some material in the record indicates that where two sources emit sound at identical decibel levels, an overall higher decibel level results. (*See* Ex. D, p. 12, indicating that 60 dBA + 60 dBA = 63 dBA.). From this information, a layperson might conclude, whether rightly or wrongly, that each of those two sources would be distinguishable from the other. Such a conclusion then raises the question, "At what higher decibel level will one sound source wash out the sound from a source with a lower decibel level?"

Also, an expert for the Respondent in the field of "human factors" made audio-video recordings that depict an attempted replication of the conditions and the movement of the truck in reverse at the time of the fatal accident. (Ex. A). These recordings indicate that the sound of the reverse alarm was generally distinguishable from the surrounding traffic noise roughly 15 to 18 seconds before reaching the point of impact (with the truck apparently traveling near the low end of the five to seven m.p.h. range, although the truck's actual reverse speed in the recordings is not provided). (Ex. A). (*Footnote 6 continues on following page.*)

It is apparent that some properties of sound and noise are beyond an average layperson's knowledge and experience and are thus properly the subject of expert testimony.[7] The matter of whether a sound source with a decibel level that is less than or equal to the surrounding noise may or may not be "audible above" [29 C.F.R. § 1926.601(b)(4)(i)] or "distinguishable from" [Ex. C, p.1] the surrounding noise, involves "scientific, technical, or other specialized knowledge" that is outside the common knowledge and experience of the trier of fact. *See* Federal Rule of Evidence 702, "Testimony by Expert Witnesses."[8]

Scientific or technical information relating to the effect of ambient noise (such as traffic noise) on the audibility or distinguishability of another sound source with a different frequency

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(*Continuation of footnote 6*):

If taken at face value, the recordings would seem to refute the evidence on which the Secretary relies to prove the violative condition. However, the recordings are not entitled to such controlling or even significant weight, because no data were presented on the decibel levels of either the traffic or the reverse alarm as depicted in the recordings, despite the fact that a sound level meter was being used. With the absence of such sound level data, it is not possible to compare the expert's effort at replication of the accident conditions to the CO's measurements of the decibel levels of both the reverse alarm and the traffic noise. *Cf. Con Agra Flour Milling Co.*, 16 BNA OSHC 1137, 1141 (No. 88-1250, 1993) (noting expert evidence "is not necessarily controlling even if it is unrebutted") *rev'd on other grounds*, 25 F.3d 653 (8th Cir. 1994). The expert's audio-video recordings are discussed here mainly to highlight the ill-defined quality of most of the evidence on the issue of whether the reverse alarm was distinguishable from the surrounding noise level on July 16, 2013. That ill-defined evidence includes not only the expert's audio-video recordings (Ex. A), but also the same expert's written report at Exhibit E.

[7] *See*, *e.g.*, the information published on the OSHA website regarding the "Physics of Sound," accessed on 7/9/2015: www.osha.gov/dts/osta/otm/noise/health_effects/physics.html.

[8] The 1972 Notes of the Advisory Committee to the then proposed Fed. R. Evid. 702 stated that even though "[m]ost of the literature assumes that experts testify only in the form of opinions," the rule "recognizes that an expert on the stand may give a dissertation or exposition of scientific or other principles relevant to the case, leaving the trier of fact to apply them to the facts." And the Notes of the Advisory Committee to the year 2000 proposed amendment to the rule in response to *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), observed that the "amendment does not alter the venerable practice of using expert testimony to educate the factfinder on general principles" of scientific, technical or other specialized knowledge.

and decibel level (such as a reverse signal alarm) was not presented in evidence. The absence of any such evidence renders it impossible to make a finding (supported by substantial evidence) on the relative audibility of the disparate sound sources. Such a finding, however, is an essential component of the Secretary's theory of proof that the truck's alarm was not audible above the surrounding noise level. The absence of evidence to support a finding on this technical matter precludes a finding in favor of the Secretary on this element of the Secretary's burden of proof.[9]

Element 4 – Employer Knowledge

The following discussion on the "employer knowledge" element assumes for purposes of analysis that the Secretary has met his burden to prove that Lammon Brothers had failed to comply with the cited standard.

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[9] It is certainly possible that Lammon Brothers violated the standard on July 16, 2013, but that the Secretary was unable to marshal the evidence to prove it. It is similarly possible that Lammon Brothers complied with the standard -- meaning that the reverse alarm had been audible to the decedent in sufficient time for him to avoid contact, but that he was not mindful of the sound. Such inattentiveness is plausible, particularly considering that the decedent was believed to have known that the concrete pad was the dedicated travel lane for the dump trucks and that workers on foot were to follow a route that was about 30 feet away from the concrete pad.

Inattentiveness of the decedent is further plausible given the ubiquity of the sound of reverse alarms at the highway construction site. In employee interviews conducted after the accident, one worker told the CO that he thought, "you get immune to" the sound of reverse alarms, and another said, "Honestly, I think you get complacent to the noise." (Ex. D, pp. 29 & 33). Such worker perceptions are consistent with an observation made by OSHA in 2012 in connection with its "Request for Information" on preventing backover injuries and fatalities. In that request, OSHA noted that because single tone backup alarms "are used in so many applications, some workers may not pay attention to the alarms," and "[i]t also may be difficult for workers to determine from what direction the tone is coming." Reinforced Concrete in Construction, and Preventing Backover Injuries and Fatalities, 77 Fed. Reg. 18973, 18981 (March 29, 2012).

It appears that it is not uncommon for backover fatalities to occur in construction zones even when a vehicle's reverse alarm is functioning properly. In that same 2012 Request for Information, OSHA noted that out of 25 construction-related backover fatalities described in data compiled by NIOSH, "the backup alarm on the vehicle was functioning properly" in 15 of them (60%), "suggesting that backup alarms may not be sufficient to prevent backover accidents." *Id.*, 77 Fed. Reg. at 18980.

In order to establish employer knowledge, the Secretary must show that Lammon Brothers either knew of the violative condition (actual knowledge), or with the exercise of reasonable diligence could have discovered it (constructive knowledge). *Donohue Indus., Inc.*, 20 BNA OSHC 1346, 1348-49 (No. 99-0191, 2003).

There is no evidence to establish that Lammon Brothers had actual knowledge of the alleged violative condition (i.e., that the reverse alarm on the truck involved in the fatal accident was not audible above the surrounding noise level).

In determining whether Lammon Brothers had constructive knowledge, the exercise of "reasonable diligence" in discovering the alleged violative condition includes Lammon Brothers' "obligation to inspect the work area, to anticipate hazards to which employees may be exposed, and to take measures to prevent the occurrence." *Frank Swidzinski Co.*, 9 BNA OSHC 1230, 1233 (No. 76-4627, 1981). The Secretary bears the burden of demonstrating that Lammon Brothers' conduct constituted a failure to exercise reasonable diligence. *Precision Concrete Constr.*, 19 BNA OSHC 1404, 1407-08 (No. 99-0707, 2001). The Secretary has not met his burden.

The Secretary contends that Lammon Brothers "failed to exercise reasonable diligence in abdicating its obligation to inspect the work area, to anticipate hazards to which employees may be exposed, and to take measures to prevent occurrence." (Sec'y Br. 14). The Secretary asserts that Lammon Brothers could have discovered the alleged violative condition if it had (1) inspected the worksite, or (2) measured and compared the respective decibel levels of the traffic noise and the reverse alarm. (Sec'y Br. 14-15). The evidence is insufficient to establish that Lammon Brothers failed to exercise reasonable diligence in either respect.

The drivers of the Lammon Brothers trucks tested the reverse alarms at the beginning of each working day as part of a pre-trip inspection. The alarm on the truck involved in the fatal accident was rated by the manufacturer at 97 dB, and it was operable and functioning on the day of the accident. (Stip. ¶ 4; Ex. F). The drivers of the Lammon Brothers trucks traveled in reverse down the concrete pad at a speed in the range of five to seven m.p.h. (i.e., between 7.3 and 10.3 feet per second). (Tr. 135, 144; *see* footnote 3, *supra*).

By July 16, 2013, Lammon Brothers had been delivering concrete to the project for over a year. One of the owners and operators of Lammon Brothers, Mr. Robert Lammon, had been personally delivering concrete to the construction site throughout that time, and he was operating a Lammon Brothers truck on the construction site when the fatal accident occurred. (Tr. 124-25, 136-37).

For as long as Lammon Brothers had been delivering concrete to the project, no concerns had been voiced from any quarter – not from workers, not from Shelly & Sands, not from the Ohio Department of Transportation officials present on site – that any of the reverse alarms on its trucks were not loud enough. (Tr. 131-32; Stip. ¶¶ 5 & 6). Moreover, none of the workers that the CO interviewed after the fatal accident reported that the reverse alarms on any of the concrete delivery trucks servicing the project (including the dump trucks of other subcontractors) were not audible above the traffic noise.[10]

Shelly & Sands had developed and implemented an internal traffic control plan. Under the traffic control plan that was operative on July 16, 2013, the concrete pad was dedicated to the

[10]One worker told the CO that "when you have traffic on the left and right of you, it is hard to hear a backup alarm" (Ex. D, p. 35), and another stated that during rush hour "you can hear the alarm but you have to listen for it" (Ex. D, p. 31), but neither of those workers said the alarms were not audible above the traffic noise. *See also* two other employee statements at Exhibit D, page 29 ("Yes, you can hear the backup alarms") and page 33 ("If I was walking … in rush hour traffic, I could hear the trucks backing up on this job").

use of the delivery dump trucks. Workers had been instructed that when on foot they were to traverse the construction site on a route that was about 30 feet away from the concrete pad. Even though Shelly & Sands' development and implementation of the traffic control plan did not relieve Lammon Brothers of its responsibility to comply with the cited standard, Lammon Brothers, in the exercise of reasonable diligence, could reasonably take into account the efficacy of the traffic control plan as part of its inspection and assessment of the work area in anticipating hazards. *See* Reinforced Concrete in Construction, and Preventing Backover Injuries and Fatalities, 77 Fed. Reg. at 18982 (stating that "another method used to address backover hazards" are internal traffic control plans that "coordinate the flow of construction equipment, workers, and vehicles at a worksite to prevent vehicle impacts with workers"). The Secretary has not proven by a preponderance of the evidence that Lammon Brothers failed to exercise reasonable diligence in its inspection of its vehicles and the work area.

With regard to the Secretary's contention that the exercise of reasonable diligence required Lammon Brothers to measure the respective decibel levels of the traffic noise and the reverse alarm, a preponderance of the evidence does not support that assertion.

The Secretary bears the burden to establish that using a sound level meter at this construction site was the reasonably diligent thing for Lammon Brothers to do. *Precision Concrete Constr.*, 19 BNA OSHC at 1407-08 (Secretary has burden of identifying what reasonable diligence required). But as discussed above in connection with Element 2, the evidence is insufficient to establish that comparing the respective decibel levels of the alarm and the traffic noise would conclusively show whether the alarm was distinguishable from the surrounding noise. The Secretary has thus failed to carry his burden to show that sound level testing would have resulted in the discovery, and thus the prevention, of the alleged violative

condition. *LJC Dismantling Corp.*, 24 BNA OSHC 1478, 1481 (No. 08-1318, 2014) (finding no constructive knowledge based in part on Secretary not identifying additional measures employer should take to prevent the occurrence of violations).

What is more, the only evidence bearing on the reasonableness of using a sound level meter to assess the audibility of the truck's reverse alarm was Robert Lammon's credible testimony that he had never seen a contractor or subcontractor use a sound level meter at any construction site. (Tr. 141). Mr. Lammon's observation is consistent with a recent OSHA Request for Information, which describes various measures taken on construction sites to avoid backover impacts. Notably, measuring sound levels is *not* among any of the various measures described. Reinforced Concrete in Construction, and Preventing Backover Injuries and Fatalities, *supra*, 77 Fed. Reg. at 18979-84.

The Secretary has failed to meet his burden to demonstrate that Lammon Brothers had constructive knowledge of the alleged violative condition.

Findings of Fact and Conclusions of Law

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

ORDER

Based on these findings of fact and conclusions of law, it is ordered that Item 1 of Citation 1, alleging a serious violation of 29 C.F.R. § 1926.601(b)(4)(i), is VACATED.

/s/
WILLIAM S. COLEMAN
Administrative Law Judge

Date: July 21, 2015