MEMORANDUM
TO: Dr. Donna Lee Jones, U.S. EPA (D243-02)
FROM: Jeff Harris, EC/R
DATE: March 13, 2008
SUBJECT: Collected Teleconference Records for Docket

This memo collects teleconference records performed in 2006 and 2007. The telephone calls were made 1) to obtain information in support of the Section 114 survey of metal fabrication and finishing companies, and 2) to obtain information to support development of control cost estimates for metal fabrication and finishing operations.

The teleconferences referenced include the following:

1) 6/26/06 to National Electrostatics, Middleton, WI,
"Abrasive blasting at National Electrostatics, Middleton, WI"

2) 9/25/06 to CMC Steel, Taylor SC,
"Abrasive blasting at CMC Steel Taylor, SC"

3) 2/21/2007 to Swan Secure Products Inc.
"Metalworking Activities at Nonferrous Nail Manufacture Plant"

4) 6/5/07 to John Deere
"Pulse Welding and Abrasive Blasting at John Deere Facilities"

5) 7/19/07 to National Oilwell Varco (NOV)
"Abrasive Blasting at NOV Facilities"

6) 7/20/07 to Empire Abrasive Equipment Company
"Abrasive Blasting Chamber Cost Estimation"

7) 7/25/07 to CMC Steel, Victoria, TX
"Outdoor Abrasive Blasting"

8) 7/25/07 to Jerry Siko, Lincoln Electric Inc.
"Costs for Pulsed Current vs Standard Welders – Update"

9) 7/25/07 to Dick Smith, Lincoln Electric Inc.
"Low-Fume Welding Rod Availability"

10) 8/1/07 to Abrasive Blast Systems, Georgia Distribution Center
"Abrasive Blasting Chamber Cost Estimate: Abrasive Blast System"

11) 8/6/07 to Brown-Minneapolis Tank, Albuquerque, NM
"Abrasive Blasting of Large Parts"

TELECOMMUNICATION

DATE:	June 26, 2006
CALLER:	Jeff Harris
COMPANY:	EC/R Inc.
TELEPHONE NO.	919/484-0222 x311
PERSON CALLED:	Tom Monk, Senior Manager
COMPANY:	National Electrostatics, Middleton, WI
TELEPHONE NO.	(608) 831-7600
SUBJECT:	Abrasive blasting at National Electrostatics, Middleton, WI

I called Mr. Monk to clarify the existence of control devices on the abrasive blasting operations at National Electrostatics Middleton, WI facility. Their survey response was inconclusive. After a short consultation, Mr. Monk confirmed that their shot blast machine is a very small glove box device, with a Torit filter attached for PM control.

TELECOMMUNICATION

DATE:	September 25, 2006
CALLER:	Jeff Harris
COMPANY:	EC/R Inc.
TELEPHONE NO.	919/484-0222 x311
PERSON CALLED:	Glen Shealy, ESH Manager
COMPANY:	CMC Steel, Taylor SC
TELEPHONE NO.	(803) 413-1262 (cell)
SUBJECT:	Abrasive blasting at CMC Steel Taylor, SC

I called Mr. Shealy to clarify the existence of control devices on the abrasive blasting operations at CMC Steel's Taylor, SC facility. Their survey response indicated no control, while their permit indicated an integral control device. After a short consultation, Mr. Shealy confirmed that their shot blast machine is a Wheelabrator, with an integral cartridge filter dust collector. He added that it emits less than 1 lb/hr of PM, as calculated according to AP-42.

TELECOMMUNICATION

DATE:	February 21, 2007
CALLER:	Jeff Harris
COMPANY:	EC/R Inc.
TELEPHONE NO.	919/484-0222 x311
PERSON CALLED:	Bart Swan
COMPANY:	Swan Secure Products Inc. http://www.swansecure.com/
TELEPHONE NO.	(800) 966-2801
SUBJECT:	Metalworking Activities at Nonferrous Nail Manufacture Plant

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I contacted Swan Secure at their Baltimore, MD headquarters, and was connected with Bart Swan. I explained the purpose of my call, and asked him about the process employed to manufacture non-ferrous nails. He stated that they purchase wire in various gauges and made from metals including aluminum, brass, commercial bronze, copper, monel (a nickel-copper alloy), and silicon bronze. The wire is then machined to create the head and point. The point is created by the cutting process, while the heads are cold formed. The process is very simple. They do not perform any plating. The same process is also employed to manufacture stainless steel nails.

Mr. Swan confirmed that the other U.S. manufacturer of non-ferrous nails is Clendenin Brothers, also located in Baltimore, MD. He said that a lot of the market is served by imports. He stated that he is unaware of any trade association for the nail and fastener industry.

TELECON

Project:	Metal Fabrication Area Source GACT
Date:	June 5, 2007
Person Called:	Mr. Cory Reynolds John Deere 18600 South John Deere Road Dubuque, Iowa 52004 (563) 589-6343 (office) (563) 320-2788 (cell)
Person Calling:	Mary-Jo Caldwell Caldwell Environmental, Inc. (on behalf of EC/R, Inc.)
Subject:	Pulse Welding and Abrasive Blasting at John Deere facilities

I told Mr. Reynolds that EC/R, Inc. was working with the U.S. EPA on developing a regulation for area source metal fabrication facilities. A site visit was made in March 2003 to the John Deere facility in Davenport, Iowa, and during the site visit John Deere's research into and application of pulse welding was discussed. The purpose of this phone call was to follow up to find out the status of John Deere's pulse welding research and to discuss whether pulse welding is being used more at John Deere's facilities and in the industry as a whole, compared to 2003. In addition, I asked Mr. Reynolds several questions about abrasive blasting operations in facilities like John Deere.

Mr. Reynolds said that today, approximately 90% of John Deere's welding operations are pulse welding. Most of the operations were converted to pulse welding when old equipment was phased out, and that pretty much all conversions have been made. In some instances, depending on the application and the power supply available, pulse welding is not used. John Deere is not really doing any more research into pulse welding at this time.

I asked Mr. Reynolds if the pulse welding technology had advanced since 2003. He said that there have been technological advances on the pulse welding equipment supplier's side, so that the pulse welding process is now more "robust", easier to apply, more user friendly, easier to order parts, etc.

I asked if they had experienced any unexpected difficulties as they've increased the use of pulse welding in their facilities. He said that they had been using the technology for long enough that they've pretty much figured it out. He said that it is still a more difficult process than conventional, constant voltage welding, but worth it.

I asked if he thought the use of pulse welding had increased in the heavy equipment manufacturing sector overall. He said that he did think the larger heavy equipment and agricultural equipment manufacturers were using pulse welding more. He said that was his

sense, but that he didn't have any quantitative sense of the increase. He said he was not familiar with the smaller fabrication shops, and could not say if the use of pulse welding had increased in that sector.

John Deere initially evaluated pulse welding as a means of reducing the fume for the workers. Although they were meeting all regulatory standards at the time, they were interested in reducing welding fume.

I asked Mr. Reynolds if welding generally took place in a booth. He said it generally does not occur in a booth per se, but where it occurs depends on the facility and the ventilation. In some of the large facilities there is so much air circulating in all areas of the plant that specific ventilation for welding operations is not needed. In other facilities, the welding area is sometimes defined by long drop curtains that drop from the ceiling to within about 3 feet of the floor, and the fume is extracted and filtered (for particulate), and recirculated back into the area.

Mr. Reynolds said that although they still do a significant amount of manual welding, there has been a move towards using robotic welding more. Some facilities are ~90% + robotic welding, and others are lower. His off the cuff estimate is that probably about 70% of their welding operations at John Deere overall are robotic – more at some facilities, less at others. The robotic welding operations do take place inside a booth of sorts – it has no roof, and on one side there is operator access. There may be say four robotic welding operations in an area, and the area may be cordoned off by ceiling to floor curtains, and air from the curtained area is vented and filtered to remove particulate. He said that their Wisconsin facility was that way, as was the Fuquay Varina facility.

I told Mr. Reynolds that at the time of the site visit, EC/R learned that John Deere found that rectangular wave pulsing produced significantly less fume than standard pulsing. Mr. Reynolds said that was true, and that rectangular based waveforms are now pretty much standard. Rectangular based waveforms are used by the power supply manufacturers, who have made advances in applying the rectangular wave pulsing so that the systems are now easier to use.

I told Mr. Reynolds that we are also looking at the potential control of abrasive blasting operations, and asked if I could ask him about abrasive blasting operations at John Deere to try to learn more about such operations in general in the heavy equipment manufacturing sector, and he agreed. I asked if shot-blasting operations are generally fully enclosed. Mr. Reynolds said that they are fully enclosed. At John Deere facilities, to ensure they get the weld and paint adhesion qualities they require, 100% of the cut parts are shot blasted. The shot blasting operation is mechanical/automated – no man is in the booth. A piece rides into the enclosed area on a conveyor, and passes through curtains as it enters and exits the booth. There are trays at the bottom of the booth, the blast falls to the ground and is filtered and usable shot is recirculated to a hopper where it is used again. The booth is ventilated and filtered to separate out usable shot and to remove particulate. The filters are manually replaced as needed. He was not sure exactly what types of filters they use, but said that in some instances the air is sent to a "Torit type" system.

Mr. Reynolds said that he thought it was probably common for a shot blasting operation to be fully enclosed just due to the nature of the operation. Although he didn't have direct knowledge of the smaller shops, he thought they probably also have shot blasting operations enclosed at

least to some extent, even if they are manual blasting operations. He said that Pang Born manufactures the shot blasting equipment used by John Deere.

I asked if welding and abrasive blasting operations were likely to occur in the same booth. Mr. Reynolds said that they would not be performed in the same booth, but could well be adjacent operations.

TELECOMMUNICATION

DATE:	July 19, 2007
CALLER:	Jeff Harris
COMPANY:	EC/R Inc.
TELEPHONE NO.	919/484-0222 x311
PERSON CALLED:	Victor Bedford, Gulf Coast HSE Manager
COMPANY:	National Oilwell Varco
TELEPHONE NO.	(713) 375-3731
SUBJECT:	Abrasive Blasting at NOV Facilities

Mr. Bedford and I corresponded by e-mail several times, and he provided more detailed information on specific operations at several facilities, which was entered into the survey response summary database. I called him to clarify and confirm the answer to our question regarding the reason why some National Oilwell Varco (NOV) facilities reported performing abrasive blasting operations outdoors.

Mr. Bedford stated that outdoor blasting at NOV facilities is performed on very large objects, typically partially or fully assembled offshore drilling rigs. He added, however, that current market conditions (high oil prices, resulting in equipment being kept in the field to maximize use) have almost completely eliminated this sort of blasting. He agreed that in the future it might become more common again.

Mr. Bedford stated that the NOV facility at Galena Park, TX is equipped with a very large blast booth (80' deep x 40' wide x 25' tall) which can accommodate all but the very largest objects.

TELECOMMUNICATION

DATE: July 20, 2007

CALLER: Joanne Seaman
COMPANY: EC/R Inc.

PERSON CALLED: Myron Faulk
COMPANY: Empire Abrasive Equipment Company
TELEPHONE NO. 813-681-6707

SUBJECT: Abrasive Blasting Chamber Cost Estimation

Mr. Faulk was called as a follow-up from an earlier call to obtain cost estimates for blast rooms. Mr. Faulk explained how difficult it is to cost a "generic" blast room by describing the five necessary components of a blast room.

1) The enclosure. The size of the enclosure must be large enough to hold the item being blasted plus 3 to 5 feet of space on either side. Additionally, the height of the enclosure must be determined. Further, lighting must be included in the cost of the enclosure.

2) Dust collection. A dust collector must be designed for the space. The volume of air to enter the dust collector is determined by multiplying the "ventilation width" for the smallest cross-section of the room by the "crossdraft." The crossdraft is how quickly you want to clean the air space. Mr. Faulk explained that for a nonhazardous material, 50 cfm is a standard crossdraft rate, however, for more hazardous material the value of 100 cfm is frequently used. For example, a room with the smallest cross section of 10 X 10ft requiring a crossdraft of 100 would require a dust collector that can handle 10,000 cfm.

3) Recovery. This term refers to the recovery of the media used to blast the surface. He explained that typically people use the enclosed blast room system in order to reuse the media, therefore, they expect a high recovery of the blast media. The "fracture rate" is used to determine the recovery rate. The fracture rate is how quickly the media breaks up. For example coal slag has a fracture rate of 50% and steel has a fracture rate of 98.9%.
Mr. Faulk forwarded a brochure with examples of reclaim components and reclaim floor designs. The reclaim components described in the brochure were air-wash separator/classifier, blast tank assemblies, elevator, abrasive storage hopper with a caged ladder, screws or metering shed plates. The reclaim floor designs in the brochure were the single screw partial reclaim system, the "H"-shaped partial reclaim system, the "u"-shaped partial reclaim system and the full floor reclaim system.

4) Cleaning of the blast media. The surface contaminants must be removed from the blast media. Mr. Faulk explained that this is typically done by either a cyclone reclaimer or a mechanical bucket.

5) Recylcing of the blast media. The blast room enclosure needs a means for recylcing the back through the room. Mr. Faulk explained that a hopper is typically used but sometimes a blast pot is driving the media.

Mr. Faulk explained that there are too many variables to make a generic blast room design or cost. He reported that he asked his product manager for a generic cost per linear foot in the past and will ask him for this again during their Monday meeting. I will email Mr. Faulk on Monday afternoon if he has not emailed me with an answer.

Mr. Faulk also explained that the 50% reclamation value that we had used in previous cost estimates is probably an underestimate, because a typical facility using a reclamation blast room would want a lot more recovery than 50%. As mentioned above, steel has 98+% reclamation, so a value of 95% is probably more proper.

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TELECOMMUNICATION

DATE:	July 25, 2007
CALLER:	Jeff Harris
COMPANY:	EC/R Inc.
TELEPHONE NO.	919/484-0222 x311
PERSON CALLED:	Christine Bolen
COMPANY:	CMC Steel, Victoria, TX (FSM101)
TELEPHONE NO.	(830)-372-8831
SUBJECT:	Outdoor Abrasive Blasting

Ms. Bolen returned my call regarding abrasive blasting operations at the CMC Steel facility in Victoria, TX. I mentioned that their response to EPA's survey indicated that CMC performed abrasive blasting outdoors at the Victoria facility, and asked why they found it necessary. She agreed that they had reported that in the survey, but noted that they are in the process of moving those operations indoors.

She stated that the large size of the material being blasted (components of oil rig platforms) was the reason that abrasive blasting had been performed outdoors. She was unsure of the dimensions of these structural steel members, but agreed that they were definitely larger than ten feet in one dimension.

She added that they are currently building a large blast chamber to move the operation indoors. They have two primary reasons for this change: 1) Cost reductions due to recycling of blast media. 2) They want to eliminate the production limits imposed by the Texas Permit by Rule program on outdoor blasting operations.

EC/R Incorporated

TELECOMMUNICATION

DATE: July 25, 2007

CALLER: Jeff Harris
COMPANY: EC/R Inc.
TELEPHONE NO. 919/484-0222 x311

PERSON CALLED: Jerry Siko
COMPANY: Lincoln Electric Inc.
TELEPHONE NO. (480)-348-2004

SUBJECT: Costs for Pulsed Current vs Standard Welders - Update

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Since he had been helpful in the past, I made another call to Mr. Siko. I explained our project briefly to Him, mentioning our previous conversation, and told him that I wanted to update the information I had for cost figures for pulsed-current welding machines, ideally with some comparison to the cost of standard-current machines of similar size and capacity.

He directed me to the Lincoln WWW site at http://www.lincolnelectric.com/ and told me that I could find suggested retail prices there. He offered me an updated short list of pulsed-current welders, and standard-current models that are roughly comparable. These are listed below, along with cost numbers taken from the website. The pulsed current welders range from slightly less expensive, to nearly double the cost of comparable standard welders.

Pulsed Current Welder		Comparable Standard Welder	
Model	**Price**	**Model**	**Price**
Power MIG V350MP	$4,421	Power MIG 255C	$2,416
Invertec V350-PRO Adv Process	$4,768	CV-305	$2,667
Invertec V450-PRO	$6,059	CV-400	$3,531
Power Wave 355M	$4,038	DC-400	$4,280
Power Wave 455M	$5,552	DC-600	$4,349

He stated that pulsed current welding equipment may be more expensive, but other factors must also be considered: lower power costs, smaller space requirements/equipment footprints, and potentially faster welds can make up for higher equipment costs.

Mr. Siko stated that pulsed current welding equipment has improved over the last five years or so, and that previous difficulties integrating pulsed current welding with robotic operations are no longer significant due to updated waveforms. He specifically referred to Lincoln's "Rapid Arc" wave form for pulse welding.

I attempted to question him regarding overall applicability of pulsed current welding technology to various welding technologies, and he suggested that I contact more knowledgeable persons at Lincoln's corporate headquarters in Cleveland, OH:

The Lincoln Electric Company
22801 St. Clair Ave.
Cleveland, OH 44117
General Telephone: 216.481.8100
General Fax: 216.486.1751

Mike Milton – General Sales Manager
Dick Smith – Fume Exhaust Specialist, Environmental Issues
Chris Bailey – Automation Department Manager (216) 383-2959

He suggested that a visit to the Cleveland facility would be very educational for us.

TELECOMMUNICATION

DATE: August 1, 2007

CALLER: Joanne Seaman
COMPANY: EC/R Inc.

PERSON CALLED: Matt Steinman,
COMPANY: Abrasive Blast Systems, Georgia Distribution Center
TELEPHONE NO. 770-938-7263

SUBJECT: Abrasive Blasting Chamber Cost Estimate: Abrasive Blast System

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Mr. Steinman was contacted to determine if he could provide "typical" blast room dimensions, configurations and costs for the Metal Fabrication Area Source GACT. He stated that he was glad to help since he had knowledge of the trends in the industry. Mr. Steinman explained that the company, Abrasive Blast Systems (http://www.absblast.com/), has been in this business for approximately 45 years, with 350-400 systems installed throughout the country, and that he has been a salesman for the company for 30 years.

The following table summarizes the dimensions and costs of what Mr. Steinman described as a "typical" small, medium and large blast room with a partial reclamation system and a 99.999% efficient filtration control system. These costs do not include sales tax, but do include "typical" installation costs which he reported as 30-40% of the total cost. The units for which he quoted prices have a partial reclamation system, referring to the amount of automation of the reclamation system that removes the blast media and substrate debris from the blast chamber.

Costs for "Typical" Small, Medium and Large Blast Rooms

Dimensions	Equipment Cost	Shipping Cost
12' W X 10' H X 25' L	$100,000	$6,000
16' W X 18' H X 40' L	$270,000	$12,000
18' W X 18' H X 95' L	$450,000	$19,500

The blast room systems are manufactured in Texas, which Mr. Steinman explained is fairly centrally located to their customers. The units are broken down onto freight trucks at an average cost of $3000/load, with the total shipping cost depending on the number of loads required.

Mr. Steinman explained the different types of reclamation floor configurations that are presented on the company's website and noted that the choice is product- or process-driven and not preference-driven. For example a production line that cannot tolerate any down-time would use a totally automated (or full) reclamation system; while a facility that uses the blast room intermittently could use a partial reclamation system. Mr. Steinman reported that most of the

reclamation systems he sells are partial reclamation systems. He explained that the cost for a full reclamation system is typically 30-40% higher than the partial reclamation system prices that he quoted during this telephone conversation.

In addition to providing costs for these "typical" systems, Mr. Steinman described different types of blasting media, which fall into one of two categories: ferrous (or steel-based) or nonferrous. Mr. Steinman described the differences in cost for the two categories (detailed below), but explained that economics is not the only factor used to determine appropriate media for a job. He used the example of refurbishing heavy equipment such as tractors, for which ferrous abrasives are undesirable. He explained that the steel abrasive media is so small that the particles get caught in the crevices of the equipment. Over time these remaining steel particles rust and bleed through the paint.

Mr. Steinman reported that the costs of the ferrous abrasives are approximately $0.50/pound compared to $0.25/pound for nonferrous abrasives. He explained that although the ferrous media initially cost twice as much as nonferrous media, ferrous media end up being less expensive because they do not break down as quickly may be recycled up to 100 times. Nonferrous media may only be recycled around five times. In addition to the higher media cost due to the low recycle rate of a typical nonferrous blast media (around 80%, as compared to over 99% for ferrous media), another cost is higher waste disposal fees due to more frequent need to dispose of degraded abrasive media.

TELECOMMUNICATION

DATE:	August 6, 2007
CALLER:	Donna Lee Jones, U. S. Environmental Protection Agency, OAQPS/SPPD/Metals and Minerals Group/(919) 541- 5251
PERSON CALLED:	Michael Morris, Vice President
COMPANY:	Brown-Minneapolis Tank, Albuquerque, NM
TELEPHONE NO.	505-873-0160 ext. 4790
SUBJECT:	Abrasive Blasting of Large Parts

Mr. Morris described the blasting of fabricated steel sheets that are used to build bulk storage tanks that are subsequently erected on the customer's site. In their EPA survey response (FP-108), Brown-Minneapolis Tank stated that there was abrasive blasting out-of-doors. This blasting has been discontinued since the EPA survey (6 to 9 months ago) because some of the dust was getting past the property line and the local air pollution agency required that they enclose the structure.

In this blasting operation that was previously out-of-doors, large pieces of fabricated metal 30 feet by 10 feet are blasted. The company now uses a stand-alone 3-sided building, which was already on site, as an enclosure. The building has curtains on the fourth side that are drawn closed during blasting. The workers use supplied-air breathing apparatus during the blasting.

The blast media used is copper slag that has no silica. Mr. Morris estimated that the company uses one 25 ton bulk load about every 2 weeks. [EPA note: This corresponds to about 650 tons per year.] Brown-Minneapolis does not recycle the blast media.

On the customer's site, Brown-Minneapolis erects the tanks for the customers. For each tank, there is a two-week period in which sand blasting takes place out-of-doors to finish the weld joints. This blasting takes place during approximately half of each day during the 2-week period.

EC/R Incorporated

TELECOMMUNICATION

DATE:	July 25, 2007
CALLER:	Jeff Harris
COMPANY:	EC/R Inc.
TELEPHONE NO.	919/484-0222 x311
PERSON CALLED:	Dick Smith, Fume Exhaust Specialist, Environmental Issues
COMPANY:	Lincoln Electric Inc.
TELEPHONE NO.	(216) 481-8100
SUBJECT:	Low-Fume Welding Rod Availability

I called Mr. Smith on the recommendation of Mr. Jerry Siko, whom I had spoken with previously. I explained our project briefly to him, and told him that I wanted information on the availability and general utility of low-fume welding rods.

Mr. Smith confirmed our belief that low-fume welding rod is a developing technology which is beneficial in some circumstances, but not applicable in all situations. He said that it is only available for flux-core welding, and only for a small percentage of applications of flux-core rod use.

He also suggested that I might also want to speak with Chris Cole of Lincoln Electric. He said that he is probably the better contact for technical issues regarding fume emissions, and Chris would be the contact for regulatory issues.