U.S. Department of Transportation
United States Coast Guard

Commander
Eighth Coast Guard District
Hale Boggs Federal Building

501 Magazine St.
New Orleans, LA
Staff Symbol: moc
Phone(504)589-3624

5100
14 November 1997

From: Commander, Eighth Coast Guard District
To: Distribution

Subj: RESPIRABLE PARTICULATE AND WELDING FUME HEALTH RISK ASSESSMENT (HRA)

1. Enclosure (1) is forwarded for your information. Please ensure this information is brought to the attention of your Unit Safety and Occupational Health Officer.

G. A. TETREAU
By direction

Encl: (1) MLCLANT(kse) ltr 5100 of 22 October 1997

Dist: All Eighth District MSOs, MSU and MSDs

U.S. Department of Transportation
United States Coast Guard

Commander, Maintenance & Logistics Command Atlantic
United States Coast Guard

300 E. Main Street, Suite 1000
Norfolk, VA
Staff Symbol: kse
Phone: (757) 628 4392

5100
22 October 1997

From: Commander, Maintenance & Logistics Command Atlantic
To: Commanding Officer, Marine Safety Office Louisville

Subj: RESPIRABLE PARTICULATE AND WELDING FUME HEALTH RISK ASSESSMENT (HRA)

Ref: (a) Marine Safety Manual, COMDTINST M16000.6

1. A HRA was conducted during the recent Customer Assistance and Training (CAT) visit to determine potential exposure of MSO personnel to respirable particulates and welding fumes during new barge construction inspections at the Jeffboat Shipyard in Jeffersonville, Indiana. The September 25 monitoring took place inside a typical new barge hold on construction line 4, west position 2. The hold lay unoccupied overnight prior to collecting the first pair of samples. Subsequent samples were collected as shipyard personnel engaged in spot welding. Standard shipyard exhaust ventilation was in use in the hold. Enclosure (1) contains a summary of sampling results.

2. Several welding fume samples exceeded the 0.2 mg/M^3 ACGIH Threshold Limit Value (TLV) for Manganese. All respirable particulate samples exceeded the 3 mg/M^3 TLV. Respirable particulates are materials that are capable of entering and damaging the gas-exchange region of the lung. Due to their aerodynamic nature these particles settle out of the air very slowly. Typically, concentration of respirable particles is reduced within enclosed spaces via good air exchange.

3. In accordance with reference (a) we recommend that unit personnel not enter these spaces until the air has been adequately ventilated, including forced fresh air supply and forced exhaust. If this is not possible unit personnel may conduct their inspections using air purifying respirators with HEPA filters after oxygen levels have been determined to be above 19.5%.

R. A. ORLANDO
By direction

Encl: (1) Sample Summary Matrix
(2) Lab Results

Copy: MLCLANT (kse)
DWRO (m)
File

Sample Summary Matrix

Analytes: *Respirable Particulates and Welding Fumes*
Location: *New Barge Hold, Line 4, West Position 2*
Personnel involved: *CWO Kipouras* *MSO Louisville*
MST1 McMinimen *MSO Louisville*
LT Orlando *MLC LANT (kse) detached*
LTJG Rhambarose *MLC LANT (kse)*
Date: *25 September 1997*
Ambient Weather: *Sunny, 64.7° F to 85.8° F*
(temperatures recorded at each pre and post calibration)
Sampling Pumps: *Model SKC 224-PCXR7, SN# 514699 & SN# 514658*
Media: *Matched Weight MCEF, Expiration Date 05/99*
Calibrator: *Gillian PN#800268, Flow Cell SN#17025-5, Calibration Expires Mar 27, 1998*

Sample # (Volume @ STP)	Analyte	Concentration (mg/M^3)	ACGIH TLV (mg/M^3)	≥ TLV
JB-9-25-3-4 (244 Liters)	Respirable Particles (Dust)	6	3	YES
	Aluminum	0.3	5	-
	Iron	2	5	-
	Manganese	0.1	0.2	-
	Zinc Oxide	0.3	5	-
JB-9-25-1-3 (241 Liters)	Respirable Particles (Dust)	8	3	YES
	Aluminum	0.3	5	-
	Iron	2	5	-
	Manganese	0.2	0.2	YES
	Zinc Oxide	0.3	5	-
JB-9-25-5-4 (188 Liters)	Respirable Particles (Dust)	12	3	YES
	Aluminum	0.6	5	-
	Copper	0.6	0.2	YES
	Iron	3	5	-
	Manganese	0.3	0.2	YES
	Zinc Oxide	0.1	5	-
JB-9-25-3-3 (177 Liters)	Respirable Particles (Dust)	12	3	YES
	Aluminum	0.5	5	-
	Iron	3	5	-
	Manganese	0.2	0.2	YES
	Molybdenum	0.01	10	-
	Zinc Oxide	0.1	5	-
JB-9-25-9-4 (78 Liters)	Respirable Particles (Dust)	14	3	YES
	Aluminum	0.4	5	-
	Copper	0.1	0.2	-
	Iron	6	5	-
	Manganese	0.3	0.2	YES
	Zinc Oxide	0.1	5	-
JB-9-25-9-3 (74 Liters)	Respirable Particles (Dust)	19	3	YES
	Aluminum	0.5	5	-
	Copper	0.1	0.2	-
	Iron	6	5	-
	Manganese	0.3	0.2	YES
	Molybdenum	0.03	10	-
	Zinc Oxide	0.1	5	-

ENCLOSURE(/)

LabCorp
Analytics Division
Laboratory Corporation of America™ Holdings
PO Box 25249
Richmond, Virginia 23260
Telephone: 800-888-8061

Rcvd. 10/20/97
Michael A. Clinkscales

Group No. B275041
Account No. 24409325
Report Date: 10/09/97

RICK ORLANDO
USCG MLC ATLANTIC (KSE) DETACHED

1222 SPRUCE ST RM 2.102A
ST LOUIS, MO 63103-2832

Final Report

Date Received: 10/02/97
Sample Type: 9 - Matched Weight filter
Project: JEFCO-MSO LOUISVILLE PO Number:

Analytical Results

Lab	Client ID	Parameter	Volume	Amount	Concentration	
-001	JB-9-25-3-4 Sample Date: 09/25/97		244L			
-		Respirable Dust	0	1.51 mg	--	6 mg/M3
-		Aluminum	NVG	66.5 ug	-- --	0.3 mg/M3
-		Antimony	NVG	< 2.00 ug	-- --	
-		Beryllium	NVG	< 0.100 ug	-- --	
		Cadmium	NVG	< 1.00 ug	-- --	
		Chromium	NVG	< 2.00 ug	-- --	
-		Cobalt	NVG	< 2.00 ug	-- --	
-		Copper	NVG	< 1.00 ug	-- --	
-		Iron	NVG	371 ug	-- --	2 mg/M3
-		Lead	NVG	< 2.00 ug	-- --	
-		Manganese	NVG	33.8 ug	-- --	0.1 mg/M3
-		Molybdenum	NVG	< 2.00 ug	-- --	
-		Nickel	NVG	< 2.00 ug	-- --	
-		TiO2	NVG	< 3.34 ug	-- --	
-		V2O5	NVG	< 3.57 ug	-- --	
-		Zinc Oxide	NVG	68.5 ug	-- --	0.3 mg/M3
-002	JB-9-25-1-3 Sample Date: 09/25/97		241 L			
-		Respirable Dust	0	1.81 mg	--	8 mg/M3
-		Aluminum	NVG	78.8 ug	-- --	0.3 mg/M3
-		Antimony	NVG	< 2.00 ug	-- --	
-		Beryllium	NVG	< 0.100 ug	-- --	
-		Cadmium	NVG	< 1.00 ug	-- --	
-		Chromium	NVG	< 2.00 ug	-- --	
-		Cobalt	NVG	< 2.00 ug	-- --	

ENCLOSURE(2)

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ST LOUIS, MO 63103-2832

Final Report

Date Received: 10/02/97
Sample Type: 9 - Matched Weight filter
Project: JEFCO-MSO LOUISVILLE PO Number:

Analytical Results

Lab	Client ID	Parameter	Volume	Amount	Concentration	
-		Copper	NVG	< 1.00 ug	-- --	
-		Iron	NVG	452 ug	-- --	2 mg/M3
-		Lead	NVG	< 2.00 ug	-- --	
-		Manganese	NVG	40.8 ug	-- --	0.2 mg/M3
-		Molybdenum	NVG	< 2.00 ug	-- --	
-		Nickel	NVG	< 2.00 ug	-- --	
-		TiO2	NVG	< 3.34 ug	-- --	
-		V2O5	NVG	< 3.57 ug	-- --	
-		Zinc Oxide	NVG	73.3 ug	-- --	0.3 mg/M3
-003	JB-9-25-4-4 Sample Date: 09/25/97		0 L	----------FIELD BLANK----		
-		Respirable Dust	0	0.29 mg	--	
-		Aluminum	NVG	< 2.00 ug	-- --	
-		Antimony	NVG	< 2.00 ug	-- --	
-		Beryllium	NVG	< 0.100 ug	-- --	
-		Cadmium	NVG	< 1.00 ug	-- --	
-		Chromium	NVG	< 2.00 ug	-- --	
-		Cobalt	NVG	< 2.00 ug	-- --	
-		Copper	NVG	< 1.00 ug	-- --	
-		Iron	NVG	2.32 ug	-- --	
-		Lead	NVG	< 2.00 ug	-- --	
-		Manganese	NVG	< 2.00 ug	-- --	
-		Molybdenum	NVG	< 2.00 ug	-- --	
-		Nickel	NVG	< 2.00 ug	-- --	
-		TiO2	NVG	< 3.34 ug	-- --	
-		V2O5	NVG	< 3.57 ug	-- --	
-		Zinc Oxide	NVG	< 2.48 ug	-- --	

A23

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Final Report

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Project: JEFCO-MSO LOUISVILLE PO Number:

Analytical Results

Lab	Client ID	Parameter	Volume	Amount	Concentration
-004	JB-9-25-5-4	Sample Date: 09/25/97	188 L		
-		Respirable Dust	0	2.29 mg	-- 12 mg/M3
-		Aluminum	NVG	106 ug	-- -- 0.6 mg/M3
-		Antimony	NVG	< 2.00 ug	-- --
-		Beryllium	NVG	< 0.100 ug	-- --
		Cadmium	NVG	< 1.00 ug	-- --
-		Chromium	NVG	< 2.00 ug	-- --
-		Cobalt	NVG	< 2.00 ug	-- --
-		Copper	NVG	1.10 ug	-- -- 0.6 mg/M3
-		Iron	NVG	617 ug	-- -- 3 mg/M3
-		Lead	NVG	< 2.00 ug	-- --
-		Manganese	NVG	55.4 ug	-- -- 0.3 mg/M3
-		Molybdenum	NVG	< 2.00 ug	-- --
-		Nickel	NVG	< 2.00 ug	-- --
-		TiO2	NVG	< 3.34 ug	-- --
-		V2O5	NVG	< 3.57 ug	-- --
-		Zinc Oxide	NVG	22.7 ug	-- -- 0.1 mg/M3
-005	JB-9-25-2-3	Sample Date: 09/25/97	0 L		FIELD BLANK
-		Respirable Dust	0	< 0.10 mg	--
-		Aluminum	NVG	< 2.00 ug	-- --
-		Antimony	NVG	< 2.00 ug	-- --
-		Beryllium	NVG	< 0.100 ug	-- --
-		Cadmium	NVG	< 1.00 ug	-- --
		Chromium	NVG	< 2.00 ug	-- --
-		Cobalt	NVG	< 2.00 ug	-- --

RES

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ST LOUIS, MO 63103-2832

Final Report

Date Received: 10/02/97
Sample Type: 9 - Matched Weight filter
Project: JEFCO-MSO LOUISVILLE PO Number:

Analytical Results

Lab	Client ID	Parameter	Volume	Amount	Concentration
-		Copper	NVG	< 1.00 ug	-- --
-		Iron	NVG	< 2.00 ug	-- --
-		Lead	NVG	< 2.00 ug	-- --
-		Manganese	NVG	< 2.00 ug	-- --
-		Molybdenum	NVG	< 2.00 ug	-- --
-		Nickel	NVG	< 2.00 ug	-- --
-		TiO2	NVG	< 3.34 ug	-- --
-		V2O5	NVG	< 3.57 ug	-- --
-		Zinc Oxide	NVG	< 2.48 ug	-- --
-006	JB-9-25-6-4 Sample Date: 09/25/97		0 L	----------FIELD BLANK	
-		Respirable Dust	0	< 0.10 mg	--
-		Aluminum	NVG	< 2.00 ug	-- --
-		Antimony	NVG	< 2.00 ug	-- --
-		Beryllium	NVG	< 0.100 ug	-- --
-		Cadmium	NVG	< 1.00 ug	-- --
-		Chromium	NVG	< 2.00 ug	-- --
-		Cobalt	NVG	< 2.00 ug	-- --
-		Copper	NVG	< 1.00 ug	-- --
-		Iron	NVG	2.11 ug	-- --
-		Lead	NVG	< 2.00 ug	-- --
-		Manganese	NVG	< 2.00 ug	-- --
-		Molybdenum	NVG	< 2.00 ug	-- --
-		Nickel	NVG	< 2.00 ug	-- --
-		TiO2	NVG	< 3.34 ug	-- --
-		V2O5	NVG	< 3.57 ug	-- --
-		Zinc Oxide	NVG	< 2.48 ug	-- --

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Sample Type: 9 - Matched Weight filter
Project: JEFCO-MSO LOUISVILLE PO Number:

Analytical Results

Lab	Client ID	Parameter	Volume	Amount	Concentration
-007	JB-9-25-3-3 Sample Date: 09/25/97		177 L		
-		Respirable Dust	0	2.19 mg	-- 12 mg/M3
-		Aluminum	NVG	81.3 ug	-- --0.5 mg/M3
-		Antimony	NVG	< 2.00 ug	-- --
-		Beryllium	NVG	< 0.100 ug	-- --
		Cadmium	NVG	< 1.00 ug	-- --
-		Chromium	NVG	< 2.00 ug	-- --
-		Cobalt	NVG	< 2.00 ug	-- --
-		Copper	NVG	< 1.00 ug	-- --
-		Iron	NVG	490 ug	-- --3 mg/M3
-		Lead	NVG	< 2.00 ug	-- --
-		Manganese	NVG	41.1 ug	-- --0.2 mg/M3
-		Molybdenum	NVG	2.13 ug	-- --0.01 mg/M3
-		Nickel	NVG	< 2.00 ug	-- --
-		TiO2	NVG	< 3.34 ug	-- --
-		V2O5	NVG	< 3.57 ug	-- --
-		Zinc Oxide	NVG	16.8 ug	-- --0.1 mg/M3
-008	JB-9-25-9-4 Sample Date: 09/25/97		78 L		
-		Respirable Dust	0	1.08 mg	-- 14 mg/M3
-		Aluminum	NVG	32.6 ug	-- -- 0.4 mg/M3
		Antimony	NVG	< 2.00 ug	-- --
-		Beryllium	NVG	< 0.100 ug	-- --
-		Cadmium	NVG	< 1.00 ug	-- --
-		Chromium	NVG	< 2.00 ug	-- --
-		Cobalt	NVG	< 2.00 ug	-- --

RJS

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1222 SPRUCE ST RM 2.102A
ST LOUIS, MO 63103-2832

Final Report

Date Received: 10/02/97
Sample Type: 9 - Matched Weight filter
Project: JEFCO-MSO LOUISVILLE PO Number:

Analytical Results

Lab	Client ID	Parameter	Volume	Amount	Concentration
-		Copper	NVG	7.45 ug	-- -- 0.1 mg/M3
-		Iron	NVG	452 ug	-- -- 6 mg/M3
-		Lead	NVG	< 2.00 ug	-- --
-		Manganese	NVG	23.5 ug	-- -- 0.3 mg/M3
-		Molybdenum	NVG	< 2.00 ug	-- --
-		Nickel	NVG	< 2.00 ug	-- --
-		TiO2	NVG	< 3.34 ug	-- --
-		V2O5	NVG	< 3.57 ug	-- --
-		Zinc Oxide	NVG	11.6 ug	-- -- 0.1 mg/M3
-009	JB-9-25-9-3 Sample Date: 09/25/97		74 L		
-		Respirable Dust	0	1.40 mg	-- 19 mg/M3
-		Aluminum	NVG	36.7 ug	-- --
-		Aluminum	0	36.6 ug	-- 0.5 mg/M3
-		Antimony	NVG	< 2.00 ug	-- --
-		Antimony	0	< 2 ug	--
-		Beryllium	NVG	< 0.100 ug	-- --
-		Beryllium	0	< 0.1 ug	--
-		Cadmium	NVG	< 1.00 ug	-- --
-		Cadmium	0	< 1 ug	--
-		Chromium	NVG	< 2.00 ug	-- --
-		Chromium	0	< 2 ug	--
-		Cobalt	NVG	< 2.00 ug	-- --
-		Cobalt	0	< 2 ug	--
-		Copper	NVG	6.95 ug	-- --
-		Copper	0	6.95 ug	-- 0.1 mg/M3
-		Iron	NVG	473 ug	-- --

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ST LOUIS, MO 63103-2832

Final Report

Date Received: 10/02/97
Sample Type: 9 - Matched Weight filter
Project: JEFCO-MSO LOUISVILLE PO Number:

Analytical Results

Lab	Client ID	Parameter	Volume	Amount	Concentration
-		Lead	NVG	< 2.00 ug	-- --
-		Manganese	NVG	25.3 ug	-- -- 0.3 mg/M3
-		Molybdenum	NVG	2.00 ug	-- -- 0.03 mg/M3
-		Nickel	NVG	< 2.00 ug	-- --
-		TiO2	NVG	< 3.34 ug	-- --
		V2O5	NVG	< 3.57 ug	-- --
		Zinc Oxide	NVG	13.3 ug	-- -- 0.1 mg/M3

NVG = No Volume Given

Total metal calculated as the oxide.

Abbreviations: ug = micrograms, mg = milligrams, mg/M3 = milligrams per cubic meter of air, g = grams, ug/M3 = micrograms per cubic meter of air, L = liters, w/w = percent weight basis, all Volumes given in liters, ppm = parts per million, ppb = parts per billion, Areas given in square feet; ND = Not Detected.

Summary of Analytical Methods

Compound Name	Analytical Method	Abbreviation
Respirable Dust	NIOSH 0600	----

N43

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Analytical Method - continued

Aluminum	OSHA ID 125	----
Antimony	OSHA ID 125	----
Beryllium	OSHA ID 125	----
Cadmium	OSHA ID 125	----
Chromium	OSHA ID 125	----
Cobalt	OSHA ID 125	----
Copper	OSHA ID 125	----
Iron	OSHA ID 125	----
Lead	OSHA ID 125	----
Manganese	OSHA ID 125	----
Molybdenum	OSHA ID 125	----
Nickel	OSHA ID 125	----
Titanium Dioxide	OSHA ID 125	TiO2
Vanadium Pentoxide	OSHA ID 125	V2O5
Zinc Oxide	OSHA ID 125	----

Notes

Attached are the results we obtained on the analysis of your samples. Any Chains-of-Custody associated with this sample group are also enclosed. Air concentrations are calculated as a convenience to the client and the overall accuracy of this result depends on both the accuracy of the air volume and the amount found by analysis. Theoretical Air Volumes for passive monitors are calculated using the sampling time submitted and the manufacturer's listed sampling rate for each compound.

We appreciate your confidence in allowing Analytics to be your testing laboratory. Any questions regarding this report can be addressed by calling our client services department (800-888-8061).

James A. Calpin, CIH
Laboratory Director