



Excellence Award

*Bechtel, Waste Treatment &
Immobilization Plant Project*

Richland, WA

February 24, 2012





Bechtel is the world's largest engineering, construction, and project management company

- BSII - Government Contracts, Environmental Cleanup Projects
- Civil - Airports and Seaports, Roads and Rail Systems
- Mining & Metals - Mines and Smelters ,
- Oil, Gas, Chemicals - Refineries and Petrochemical Facilities, Pipelines
- Power - Fossil and Nuclear Power Plants,
- Communications – Communications Networks



Hanford Waste Treatment Plant

BNII Waste Treatment & Immobilization Plant (WTP)

- Hanford Site one of the homes of the Manhattan Project
- World's largest radioactive waste treatment plant
- 56 million gallons of radioactive and chemical waste
- 3200 BNI URS & Subcontractor Employees
 - 1100 Employees in the Hearing Conservation Program





Hearing Conservation Team

(Back row left to right)

- Jacob Bailey, *Industrial Hygiene Technician*
- Jacob Lukins, *Industrial Hygiene Intern*
- Scott Nickerson, *CSP, Lead Field Industrial Hygienists*

(Front row Left to right)

- Teresa Morgan, *Senior Industrial Hygienists*
- Rachel D'Amico, *Industrial Hygienist*
- Chris Bruni, *MPH, CIH, CSP
Lead, Program Industrial Hygienist*

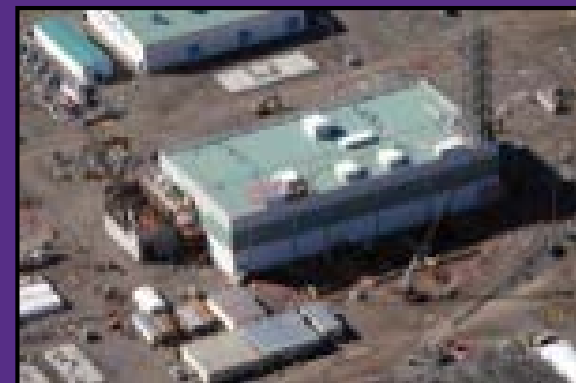
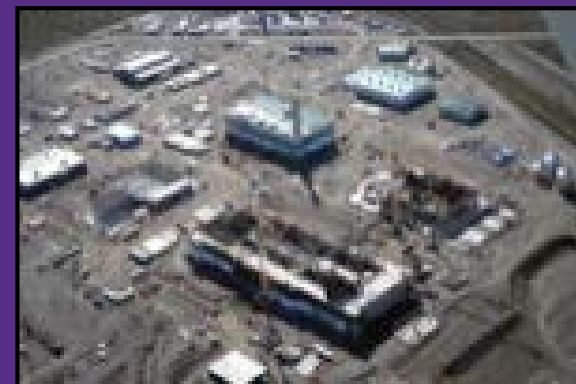




Hearing Conservation Initiative

Fully assess noise exposures at large construction site and communicate the exposure hazards to workers and management for implementing controls to address the challenges of:

- Continuous changing exposure parameters
 - Trades/Crafts
 - Environment
 - Tasks
 - Tools
- Large number of subcontractors





Initiative Elements

- Determine Regulatory Requirements
- Qualitative Noise Assessment
(Inventory of noise sources)
- Monitoring & Exposure/Environment Assessment
- Communicating Hazards & Control Methods
- Implement Controls
- Medical Evaluation
- Periodic Program Self-Assessment



Regulatory Requirements

- DOE Owned Facility – 10 CFR 851
 - OSHA – 29 CFR 1910
 - OSHA – 29 CFR 1926
 - ACGIH/NIOSH (85 dB TWA, 3 dB exchange rate)



Qualitative Noise Assessment

Inventory of Noise Sources

- Tools
- Stationary Equipment
- Mobile Equipment





Inventory of Noise Sources

Tool Sound Level Database

– Manufacturer’s Data

– NIOSH Power Tool database

<http://wwwn.cdc.gov/niosh-sound-vibration/>

– Sound Level Measurements

List of Sound Levels of Common Construction Tools.

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Company: BNI Date: 30 November 2010 Doc # 24590-WTP-LIST-SA-10-0001 Rev. 001

SA monitors and evaluates noise levels for common construction tools. This includes tools and sound levels common to construction activities. As more site-specific information is obtained, this listing of sound levels is updated. Contact Safety Assurance for any additional information.

Contact Safety Assurance for items not found on this list of tools for further evaluation.

Approval: Scott Nickerson Date: 30 Nov 2010
Lead Industrial Hygiene Signature

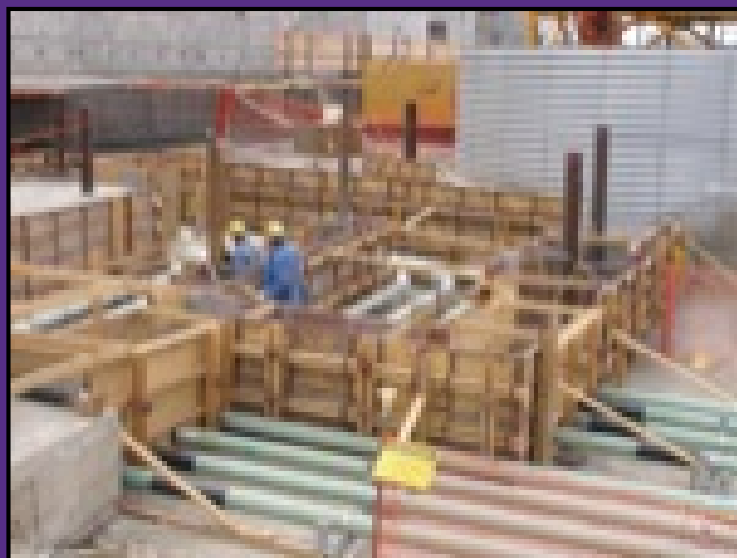
Mfg	Actual Model/Part #	General Description	dBA for HCD(AJHA etc)	Boundary Distance From Source (C=Caution D=Danger)
Bosch	1800AXK	Router, electric	95	C - 20ft
Bosch	1773AK	Planer, concrete	95	C - 20ft
Coppus	TMS	Blower, Coppus	95	C - 20ft
Coppus	TMS	Blower, Coppus	97	C - 20ft
Dayton	4TR13A	Vacuum, wet/dry	81	NA
Delta	33-411	Saw, Radial Arm	95	C - 20ft
Desco	150.229	Sander, 4.5' w/dust shroud	90	C - 10ft
Desco	1010	Vacuum, HEPA	90	C - 10ft
DeWalt	DC500	Vacuum	65	NA
Ellis	JO55-253	Saw, Band	80	NA
Evolution	180	Saw, metal cutting 7"	95	C - 20ft
Genie	TML-4000N	Tower, Light	92	C - 20ft
Ingersoll Rand	CD250	Grinder, die	83	NA
Ingersoll Rand	1720P1	Wrench, air impact 3/4"	95	C - 20ft
Ingersoll Rand	2707 P1	Wrench, air impact 1/2"	95	C - 20ft
Ingersoll Rand	AVC-13	Hammer, air impact	95	C - 20ft
Ingersoll Rand	116	Hammer, air	100	D - 10ft, C - 30ft
Ingersoll Rand	182L	Scaler (Needle gun)	99	D - 10ft, C - 30ft
Jet	X Acta Fence II	Saw, table band	95	C - 20ft
John Deere	250 Skid Steer	Tractor/Loader	99	C - 20ft
		Compressors, Air (stationary)		C - 20ft
Kobelco	KNWA2-D/H	Crane (100 ton)	88	C - 10ft
Link Belt	RTC-80100	Planer, portable 4'	95	C - 20ft
Makita	DL-37662	Saw, Circular	98	C - 20ft
MaccAir	WD12460	Fan, circular portable	71	NA
McMaster	58955A67	Hammer, air impact	95	C - 20ft
Miller AirArc	N/A	Gouging, Arc	110	Contact Safety Assurance
Miller Plasma	N/A	Plasma	99	C - 20ft
Milwaukee	Rot-Air Systems	Compressor, Air	65	NA
Milwaukee	0522-20	Drill, Cordless 18 Volt	77	NA
Milwaukee	0379-1	Drill, Close Quarter 1/2"	78	NA
Milwaukee	0244-1	Drill, 1/2"	84	NA
Milwaukee	5194	Grinder, die	85	C - 10ft

Ref: 24590-WTP-GPP-SIND-012
24590-WTP-GPP-SAIH-004

Monitoring & Hazard Assessment

- Exposure Assessment by Craft
- Exposure Assessment by Task/Equipment
- Exposure Assessment by Environment

(Worst possible exposure potential)





Monitoring & Hazard Assessment

- Extensive Monitoring is required for assessment
 - Personal Dosimetry
 - Job
 - Task
 - Environment
 - High Noise Task/Equipment

IH Overall Progress	Totals for 2008	Totals for 2009	Totals for 2010	totals for 2011	Totals for December
Exposure Evaluations					
MSDS Evaluations (MSDS-SA-YR-XXXX Rev XXX) (SAIH-001)	N/A	2049	1574	435	6
Chemical Exposures Assessment Process					
Qualitative Exposure Assessment (BEAP-SA-YR-XXX Rev XXX) (SAIH-001)	62	100	93	16	0
Exposure Control Plans (BECF-SA-YR-XXX Rev-XXX) (SAIH-001)	N/A	54	84	25	0
Exposure Surveillance Plan (BESP-SA-YR-XXX Rev XXX) (SAIH-001)	N/A	22	20	16	0
Quantitative Analysis (BEAE-SA-YR-XXX Rev XXX) (SAIH-001)	N/A	10	11	0	0
Sound Evaluation Forms (SEF-SA-YR-XXXX Rev XXX) (SAIH-004)	4	151	21	7	0
Task Ergonomic Evaluation (ERGO-SA-YR-XXXX Rev XXX) (SAIH-005)	0	0	17	174	0
Confined Space Classification (CSHE-SA-YR-XXX Rev XXX) (SAIH-006)	62	402	225	180	10
Confined Spaces Entry Evaluation (CS-SA-YR-XXXX) (SAIH-006)	7	41	319	331	35
Exposure Monitoring					
Chemical Sample Events (AMD-SA-YR-XXX) (SAIH-002)	263	282	128	409	74
Sound Level Surveys/Octave Band (SLSF-SA-YR-XXXX) (SAIH-002)	37	75	95	133	6
Sound Dosimeter Form (NMF-SA-YR-XXX) (SAIH-002)	40	281	141	112	10
Industrial Hygiene WBGT Survey (WBGT-SA-YR-XXXX) (SAIH-002)	61	182	309	30	0
Light Surveys Form (LLSF-SA-YR-XXXX) (SAIH-002)	N/A	3	12	81	9
Sampling Results Notification "Sensitive" (PMDS-SA-YR-XXXX) (SAIH-002)	N/A	10	154	136	10
Equipment Calibration Records					
Safety Assurance Calibration/Maintenance tracking Sheet (CVR-SA-YR-XXXX) (SAIH-003)	68	282	223	284	53
Qualitative Exposure Assessment (BEAP-SA-YR-XXX Rev XXX) (SAIH-001)	62	100	93	16	0
Exposure Control Plans (BECF-SA-YR-XXX Rev-XXX) (SAIH-001)	N/A	54	84	25	0

Monitoring & Hazard Assessment

Sound Level Measurements

- Tools
- Barriers – Adjacent Work Areas
- Posting Requirements





Communicate Hazards

- Inform workers what tools, tasks and environments produce hazardous noise levels
- Communicate Controls
 - Equipment Database
 - Job Hazard Analysis (JHA)
 - Training



Communication of Jobsite Controls

- Barricades and postings
- Interaction/Coordination with other workers
- Noise suppression curtains
- Areas where use of PPE is required

Controls

Engineering

- Stationary equipment
- Workshops
- Portable noise absorbing curtains



Controls

Administrative

- Coordinating scheduling of jobs
- Set-up of noise field barriers
- Posting of sound levels and barrier distance



Controls

Administrative

- Hearing Protection Required Posting
- Task rotation/time limitation
- IH Job Site Technical Assistance



Controls

PPE

- Large selection
- Minimum NRR required
- Designated single hearing protection dB range
- Designated double hearing protection dB range
- Designated double hearing protection & time limitation dB range

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Hearing Protection Device

Doc Number: 24590-WTP-LIST-SA-10-002 Rev 000

Approved Hearing Protection Devices		
Foam Ear Plugs minimum NRR of 33		
E-A-R Yellow Neons (NRR 33)	Howard Light MAX (NRR 33)	
Ear Plugs with Mechanical Aid, Stem, or No touch minimum NRR of 25		
E-A-R Ultrafit (NRR 25)	E-A-R Ultrafit 27 (NRR 27)	E-A-R Push-In Plugs (NRR 28)
Banded Hearing Protectors Caps and Supra(semi)-Aural minimum NRR of 22		
E-A-R Hearing Band Ultra-Flex (NRR 24)	E-A-R Reflex 28 Semi-Aural Banded Earplugs (NRR 28)	Howard Leight Hearing Band QB2 (NRR 25)
Hard Hat Mounted Ear Muffs minimum NRR of 22		
Bilsom Leightning L1H Helmet Mounted (NRR 23)	MSA XLS Helmet Mounted (NRR 23)	New Product Coming Soon
Ear Muffs minimum NRR of 22		
Howard Leight Leightning L2F Folding (NRR 27)	Howard Leight Leightning LIN Behind the Neck (NRR 25)	Peltor Optime 95 H6 Low Series Behind the Neck (NRR 21) <i>Only for use with P4750 for Double Hearing</i>
Hard Hat Mounted Ear Muffs - No Longer Available		
Peltor Optime 98 Helmet Mounted (NRR 23)	Bilsom Thunder T1H (NRR 23)	

If your hearing protection device is not on this list, please contact Safety Assurance for evaluation.

Industrial Hygiene: Foot Hous Supra Dvt



Medical Evaluation

- Initial Base Line
- Past Medical Records
- Yearly Audiograms
- All STS Investigated, Standard Investigation Form
- If not temporary, audiologist evaluates
- Exit Audiograms



Program Assessment

- Yearly Self Assessment
- DOE Program, Assessment
- Continuous Improvement
- Findings & corrective actions documented



Program Assessment

Employee Threshold Shifts/Hearing Loss

Present Program Implemented in 2009

- 2007 2 Recordable Employee Hearing Losses
- 2008 1 Recordable Employee Hearing Loss
- 2009 No Recordable Employee Hearing Loss
- 2010 No Recordable Employee Hearing Loss
- 2011 No Recordable Employee Hearing Loss



Lessons Learned

- Much of the WTP program has been adopted by other divisions of Bechtel
- Program elements can be incorporated with relatively low cost
- Benefits are derived beyond the Hearing Conservation Program

Future Directions

- Develop criteria for procurement procedures to evaluate tools and equipment for the noise level reduction
- Research additional engineering controls to further reduce noise:
 - Hand power, pneumatic and powder actuated tools
 - Abrasive blasting equipment
 - Mobile construction equipment
- Review cost and benefits provided by fit testing of hearing protection devices



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