Pentek Metal Coating Removal System: Baseline Report; Summary

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PENTEK METAL COATING REMOVAL SYSTEM HUMAN FACTORS ASSESSMENT - BASELINE

SECTION 1 - SUMMARY

Technology Description

The Pentek metal coating removal system consists of the ROTO-PEEN Scaler, CORNER-CUTTER®, and VAC-PAC®. The system is designed to remove coatings from steel, concrete, brick, and wood. The Scaler uses 3M ROTO-PEEN tungsten carbide cutters, while the CORNER-CUTTER® uses solid needles for descaling activities. These are used with the VAC-PAC® vacuum system to capture dust and debris as removal of the coating takes place.

Key Results

The safety and health evaluation during the testing demonstration focused on two main areas of exposure: dust and noise. Dust exposure was minimal, but noise exposure was significant. Further testing for each exposure is recommended, since the outdoor environment where the testing demonstration took place may skew the results. It is feasible that dust and noise levels will be higher in an enclosed operating environment. Other areas of concern found were arm-hand vibration, whole-body vibration, ergonomics, heat stress, tripping hazards, electrical hazards, machine guarding, and lockout/tagout.

SECTION 2 - HEALTH AND SAFETY EVALUATION

General Safety and Health Concerns

Safety and health issues of concern with the Pentek metal descaling technology included

tripping hazards, electrical hazards, rotating machinery, lockout/tagout, heat stress, ergonomics, arm-hand vibration, whole body vibration, noise, dust, and communication.

Industrial Hygiene Monitoring

During the testing demonstration, sampling was conducted for dust and noise. In addition, the wet-bulb globe temperature was monitored and observational evaluation was conducted for ergonomics, arm-hand vibration, and whole body vibration.

Ergonomically, there is potential for muscle/back stress and/or injury to the knees, wrists, hands, arms, and shoulders. Arm-hand vibration was not quantitatively measured, but it was readily apparent that there was exposure to arm-hand vibration, which could potentially cause health problems such as Raynaud's syndrome, as well as exposure to whole-body vibration.

Heat stress was monitored using wet-bulb globe measurements and worker physiological measurements such as blood pressure, pulse, and temperature. Work/rest regimen recommendations were made in accordance with ACGIH recommendations.

Personal dust sampling was conducted on the equipment operators. Personal sampling results were below allowable levels. Noise monitoring recorded a dose of 961.22% or an 8-hour TWA of 106.3 dBA for one operator, and 1281.96% or an 8-hour TWA of 108.4 dBA for the other. These were the two highest noise readings. This exceeds the OSHA action level of 85

dBa and the permissible exposure limit of 90 dBA. A hearing conservation program will be essential for anyone working with or around this equipment.

Human Factors Interface

The technology did not deposit much visible dust into the atmosphere, and air monitoring did not evidence an excessive dust level. However, there was larger debris left on the surface being descaled.

The ROTO-PEEN Scaler, CORNER-CUTTER®, and VAC-PAC® must be torn down to be decontaminated. This will not necessarily guarantee that decontamination will be complete, and a thorough inspection of the equipment will be necessary before removing it from the work site. According to the technology representative, many parts, such as the hoses and ROTO-PEENS, may be considered consumables.

SECTION 4 - REGULATORY/POLICY ISSUES

The site safety and health personnel where the Pentek metal descaling technology is being used need to be concerned with safety and health regulations applicable to the issues discussed above. Regulations

that will apply may include, but are not limited to, the following areas: housekeeping, electrical, hand and power tools, machine guarding, lockout/tagout, ionizing radiation, toxic and hazardous substances, noise, respiratory protection, PPE, HAZCOM, HAZWOPER, arm-hand vibration, and whole-body vibration.

SECTION 5 - OPERATIONAL CONSIDERATIONS & RECOMMENDATIONS

Recommendations for improved worker safety and health include good housekeeping, ergonomic training and awareness, a clamping system for vacuum hoses, guarding all moving parts, assuring proper vacuum adjustment for adequate air flow, and engineering, administrative, and/or hearing protection be used for compliance with the OSHA noise standard.

It is recommended that noise monitoring be conducted while the technology is in use in an environment of a different construction than the testing environment. Since Level A or Level B PPE may be required based on the contaminant, it is recommended that the human factors interface for these levels of protection be conducted.

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