Limited Pollution Prevention Assessment
Rock Island Arsenal
Rock Island Arsenal, Illinois

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INTRODUCTION

Rock Island Arsenal is a historical Arsenal that manufactures and rebuilds military equipment. The Arsenal has been in operation for over 150 years and has facilities to make or repair most pieces of military equipment.

Michael Springman, Waste Management and Research Center, Jim Janssen, IEPA Office of Pollution Prevention, Dr. David Foss, Rock Island Arsenal Environmental Office and Kentley Loewenstein, Rock Island Environmental Office conducted the assessment.

Because of the many functions of the Arsenal, this assessment was limited to the metal plating line and the painting operations. Since a previous assessment was done by WMRC on the plating line, that operation will not be discussed in this report.

Painting Operations Observations

The painting operation at Rock Island operates two lines and coats parts and equipment with an acrylic primer and CARC paint final coatings. The painting operation also has a small powder coating line for coating small parts. The spray-applied coatings are applied with hand held spray guns in roll through spray booths. The painting operation recently installed a new paint application system that uses high-pressure low volume to supply paint to the spray gun. This system also uses smaller paint lines that the previous system that allows for less solvent to be used to clean the lines when changing colors.

The painting operation applies about 50 gallons of paint per month. Aircraft coating thinner is being used to clean the paint lines. About 110 gallons of thinner are used per month with a purchase cost of about $485 per drum and disposal costs of about $330 per drum.

The spray guns are also cleaned in the aircraft coating thinner with small parts cleaned by hand.
Painting Operations Pollution Prevention Recommendations

Color and Paint Scheduling:

We understand that the painting operation is driven by client needs. However, it may be possible to reduce the number of color changes by processing the same color orders and paint types together. This will reduce the number of times that the paint supply lines need to be cleaned during operations.

It may also be possible to use the thinner that cleaned the paint lines to thin primer being applied. Since the primer is going to be covered by additional coatings anyway, any color change to the primer caused by pigment in the thinner really doesn’t matter.

Solvent Reclamation:

The thinner is currently being used for single pass cleaning. This thinner will still clean the paint lines, it has only taken on the pigment color of the paint cleaned from the lines. It may be possible to reuse the thinner to perform the initial line cleaning with fresh thinner to do the final line cleaning.

It may also be possible to reclaim the thinner using distillation. The Army National Guard has used distillation to reclaim their thinner for several years with great results. Their still distills about five gallons of thinner per day. The residue after distillation consists of the paint solids only, and can be disposed of as general waste. The quality of the solvent has been reported as good as, or better than new solvent. The Arsenal currently spends about $ 12,000 on new thinner and about $ 8,000 for disposal of spent thinner per year. A distillation unit can probably be purchased for the amount that is being spent annually in thinner purchase and disposal costs. This will provide a payback of 1 to 1.5 years. The success of distillation depends upon the composition of the thinner and is something that will require bench top testing or a pilot trial at the Arsenal prior to purchase.

Paint Gun Cleaning:

The paint guns are currently being cleaned by hand with a brush and thinner used to remove the paint from the gun parts. It may be possible to clean these parts using ultrasonic agitation. Ultrasonic agitation is capable of removing paint in conjunction with the thinner in areas of the paint gun that cannot be reached by current cleaning methods. A small ultrasonic unit could probably be purchased for about $1000 to $1500. This will extend the life of the gun parts and provide better spray application as well as reduce the exposure of workers to the thinner.

Laser Spray Gun Attachment:

An attachment is available for hand held spray guns that assists the operator in maintaining proper stand off and overlap. The manufacturers of this product claim that it
will reduce paint consumption by 30%, increase transfer efficiency by 13% and reduce air emissions by 31%. This unit is small and can be fitted to any spray gun. It can be used as an aid in training new painters and to assist experienced painters with their spray technique. The unit costs about $800 and is available from Laser Touch Technologies. A brochure for this item is attached to this report.

**Conclusion**

We believe that the application of the opportunities identified in this report can be used to reduce the quantity and toxicity of waste generated or eliminate waste streams.

We recommend performing bench top and/or pilot projects prior to the purchase of equipment to support these opportunities to ensure that their application produces the desired results. Cost analysis studies should also be conducted prior the purchase of the equipment to ensure that the recommended changes are cost effective.

If you have any questions, or if we can be of further assistance, please feel free to contact me at (618) 466-3806 or through my e-mail wmrc@piasanet.com.

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