Digital Photo of 600 TON Hydraulic Press

## Summary (Air Compressor and Hydraulic Press Waste Heat Recovery and Fluorescent Light Analysis)

The CEC design team, comprised of Cadets David B. Mayo (team leader), Paul B. Boulden and Sam R. Wallace, was assigned to the MODINE Manufacturing Plant in Lexington, VA. The design team's point of contact was Douglas Penney, Plant Manufacturing Engineer.

The design team was tasked to find waste heat recovery solutions for the plant's main 150 hp air compressor and 600 ton press. The team was also charged with completing a fluorescent light analysis with regards to feasibility of an upgrade and costs savings.

The available heat transfer from this 150 hp air compressor upgrade will be 1230 BTU/min resulting in $843.375 natural gas heat savings per year. This savings will be available in 1.231 years to overcome the initial of costs $1038 based on simple pay back. The present worth of the upgrade is $1586 based with an initial cost of $1038. This upgrade should be implemented during winter months to cut back on fan operating cost. The radiator will be mounted directly to the end of the air handler. See appendix Figure 9.

The available heat recovery from this 600 ton hydraulic press upgrade will be 94,710 BTU/hr resulting in an annual savings of $668.54. A simple payback period of 1.55 years was calculated for this system upgrade. The total cost to implement this upgrade was estimated to be $1684.00. This upgrade should be implemented during winter months in order to make use of the waste heat. As a secondary environmental benefit, this water discharged from the plant should return to the stream at slightly lower temperatures.

The design team's recommendation is a combination of the Electronic Extra Efficient Instant Start ballast with Reduced Wattage T8 - 28 W lamps. It has the second lowest initial cost while saving more annually than any other combination reviewed. This system also has the second shortest payback period. But over all the system out perform the others and should be implemented by your company. The next best system is the Electronic Extra Efficient Instant Start and Basic Grade F32T8 - 32W. That system is almost as good but does not provide the greatest long term savings due to the higher wattage of the system. Please note that a federal law will mandate that T12 40 watt ballasts are not to be sold after the year 2010. An upgrade should be implemented as soon as possible to capitalize on savings.

VMI CEC Design Team (Spring 2006)

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|---|---|---|
| David Mayo | Paul Boulden | Sam Wallace |
| (Team Leader) | Project Engineer | Project Engineer |