Insulate Bare Equipment (Arc 2.2511)

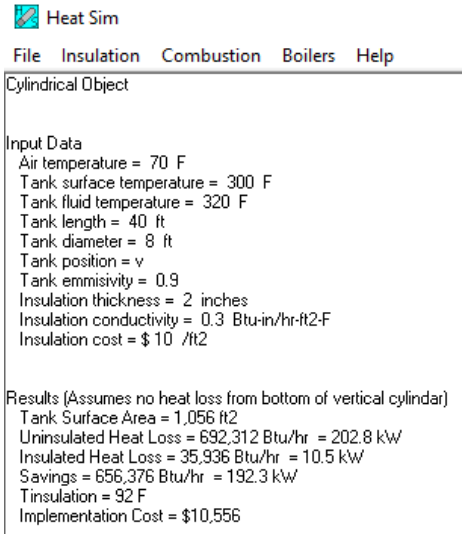
(The analysis below was extracted from one of the assessment reports by the Clemson University Industrial Assessment Center (IAC). This is only an example recommendation and hence, not all the background information and sources for numbers are included here.)

Est. Annual Gas Savings	= ***1148.66 MMBTU/yr***
Est. Gas Cost Savings	= ***$ 5,433.15 /yr***
Total Cost Savings	= ***$ 5,433.15 /yr***
Est. Implementation Cost	= ***$ 10,556***
Simple Payback Period	= ***23.31 months***

Recommended Action:
We recommend insulating the asphalt mixing drum at the plant with the standards recommended by the ASTEC.

Background:
The facility uses a cylindrical drum to mix the liquid asphalt. The drum is maintained at certain temperature using Natural Gas. The heating is done to remove the moisture from the mix. Based on site observations at the plant, the asphalt mixing drum is un-insulated. As the drum size is huge, 8 feet in diameter and 40 feet in length, insulating the drum would prevent heat from escaping the system, reduce natural gas usage and costs. Additionally, insulating the asphalt mixing drum will reduce the risk of burns and reduce the noise.

Anticipated Savings:
We measured the temperature of the surface of steam boiler to be 300 F. To calculate savings, we used the HeatSim simulation software. HeatSim calculates natural convection coefficients using ASHRAE and fundamental relations that consider the orientation and the temperature difference between the hot piping and surrounding air. The HeatSim outputs for insulating the boiler is shown in the following table.



As the results show the energy savings is 656,376 BTU/hr after insulating the asphalt mixing drum and it is operated for 1750 hours per year. The total annual energy savings will be

Annual Gas Savings = 656376 × 1750/10^6 = 1148.66 MMBTU/yr

The unit cost of natural gas for the plant is $4.73/MMBTU, the total cost savings will be

Annual Gas Cost Savings = 1148.66 × 4.73 = $ 5,433.15/yr

There is no Demand cost associated with this facility.

Implementation Cost:
The estimated implementation cost of insulating the drum is $10,556.

Implementation Cost = $10,556

Simple Payback Period:
The *simple payback period*, *SPP*, associated with installing the proposed insulation material for the boiler would be -

$$SPP = \frac{IC}{TCS} \times 12\ months/yr.$$

$$SPP = \frac{\$10{,}556}{\$5{,}433/yr.} \times 12\ months/yr.$$

SPP = 23.31 months