Government of the people's Republic of Bangladesh
Sustainable and Renewable Energy Development Authority (SREDA)
9th, 10th Floor, IEB Building, Ramna Dhaka

Energy Management Guideline for Steam Distribution System
(Energy Efficient Design, Operation, Measurement, maintenance guideline)

Use: The purpose of this Guideline is, with the aim to implement energy conservation measures on **Steam Distribution System**, to realize energy saving with setting matters on operation, measurement/record, and maintenance/inspection of it. This will be limited to Energy Performance only.

Topic	Contents	Frequency of Measurement and record	Management criteria and Frequency	Measurement device
Design standard of steam piping	**1. General Design of Steam Pipe layout**			
	Distribution Pipes Should be Shortest	Redesign when installing new pipes or in Maintenance action	This will reduce losses associated with Heat content and Pressure of the Steam	Computer Simulation
	2. Steam Pipe Sizing and Design			
	Steam Pipe Should be sized based on permissible velocity and Pressure Drop	Once at design stage	Design the Pipe based on flow velocity of steam 1. Super Heated Steam Velocity- 50-60m/sec 2. Saturated steam velocity 30-35 m/sec 3. Wet Steam Velocity 20-25 m/s Diameter Should be as High as Possible to reduce pressure drop	
	3. Steam line layout and Drainage			
	Steam Mains Should be in a Falling slope	Once at design state	Falling Slope should be higher then 125mm per 30 meter length of pipe	
	Drain points should be installed along the steam mains in an interval and lowest suitable location	Once at design state	Drain point should be 1. At 30-45 meter distance 2. At location where steam main rises, bottom of the expansion joints, before reduction and stop valves	
	Support of the Steam pipe must be firm and Level should not be altered	Once in a Year	Support of steam pipe must be sturdy	Manual inspection
	Steam Separator Must be used for dry steam	As and when required	Steam Separator can be installed in branch line or process equipment	
	4. Condensate and flash steam recovery			
	Condensate Pipe Should be sized based on condensate pressure and flowrate	Once at design stage	Diameter should be sized based on condensate flow condition. Condition 1: Flow contains only Condensate Condition 2: Flow contains mixture of condensate and flash steam	
	Condensate return line slope	Once at design stage	Condensate return line should be maintained at least 1/70 Source: Spirax Sarco website	
	5. Proper Air Venting			
	Air venting should be done when restarting after a shutdown	Once after restart	Proper air venting is required to remove non condensable gasses. Automatic air vents and in parallel with Inverted Bucket trap and thermodynamic trap	Pressure gages of outlet of air receiver and piping
	6. Steam Pipeline Insulation			
	Proper Insulation of pipe, valves & flanges must be done for reducing heat loss	Once at design stage	For reducing heat loss Economic thickness of insulation must be provided Surface temperature of thermal insulation material is to be 55C or less due to prevention of burn. Source: JIS F7008-2001	
	7. Use of Thermo Compressor			
	Make Low Pressure Steam to Medium Pressure Steam	At Design or Maintenance Stage	Use the Low-pressure unusable steam to medium pressure steam if there is an application as thermal efficiency is extremely high	

Maintenance and inspection	**8. Steam pipeline maintenance**			
	Steam piping	Once/day	1) Thermal insulation maintenance: Break of insulation of steam pipe, valves and flanges Measurement of surface temperature of insulation 2) Prevention of steam leakage: Inspection of steam leakage of valves and flanges 3) Pressure of steam: Check of set pressure	Visual check Thermometer, Thermo-viewer camera
	9. Steam Traps maintenance			
	Steam Traps	Once/day	1) Steam Trap working ?, is it failed ?, 2) Cleaning of the strainer, 3) Measurement of surface temperature of inlet of steam traps: a) Temperature is more than 60% of saturated temperature: OK b) Temperature is less than 60% of saturated temperature: Abnormal c) Temperature is less than 40C: plugging	Sight glass inspection Sound listening Thermometer
	10. Periodical inspection and maintenance			
	Periodical inspection	Once/month	1) Inspection and maintenance of corrosion, crack and other damages of pipe, valves, steam trap, pressure gage, condensate & flash steam vessel.	

For Mass Awareness by-
Sustainable and Renewable Energy Development Authority (SREDA)
Phone- 0255110347

Toufiq Rahman
Assistant Director (Standards and Labeling)