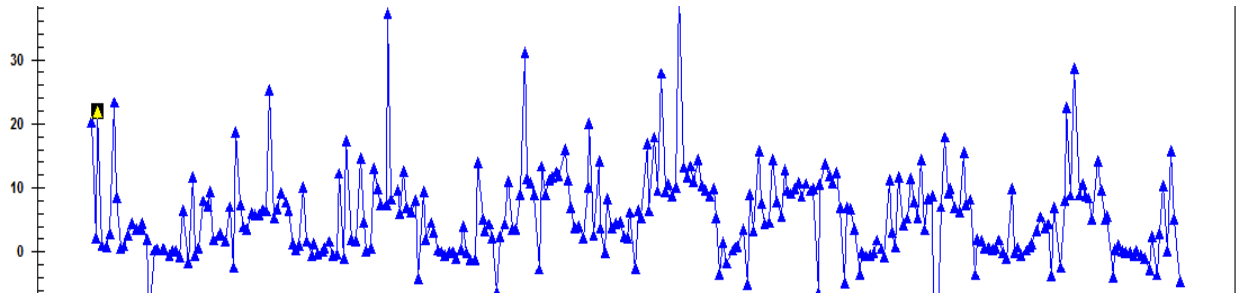
Intellihot

February 21, 2017

Subject: Water Heaters for 276 Room Hotel in Jackson, MS

To Whom It May Concern,

In most applications, hot water use is sporadic. The graph below depicts hot water consumption as measured by Intellihot in this application. Based on this data, find that 73% of the time, the water is being consumed at low draws, 25% at medium draws, and only 2% at either high or peak draws.



Thus, it is apparent that an on-demand system and one with high turn down like Intellihot is necessary to achieve true high system efficiency.

Based on flow data collected, an average of 7,200 gallons of hot water is expected to be consumed per day in this project. The following table depicts the flow patterns and quantities of how the water is consumed for similar applications.

	Range (GPM)	Duration (Minutes/day)	%	Cumulative Flow (Gallons)
Low Draw	0-5	1048	72.8%	5,242
Med Draw	5-15	356	24.7%	1,778
High Draw	15-30	29	2.0%	144
Peak Draw	30+	7	0.5%	36

Total Gallons per day	7,200

For this application, we recommend using one iQ1501 model water heater, rated at 1,501,000 BTU/h, which will satisfy your hot water needs.

The table below summarizes performance analysis of the current system – The current system is using three 700 MBH boilers with a total of 270 gallons of storage vs. Intellihot (One iQ1501 or 2-iQ751):

www.intellihot.com
2900 W. Main Street, Galesburg IL 61401
309.473.8040 main
309.296.8984 fax

	Units	Current	Intellihot
Max Firing Rate	btu/hr	2,100,000	1,501,000
Min Firing Rate	btu/hr	525,000	30,000
Rated Thermal Efficiency	%	80%	94%
Storage Capacity	Gallons	270	0

24 Hr Cycle Results

Total Gas Input	btu	9,596,160	5,215,304
Total Heat Output	btu	4,798,080	4,798,080
Standby Losses	btu	1,199,520	0
Purging Losses	btu	1,477,809	4,798
Efficiency Loss	btu	1,170,732	464,162
$ Conversion Efficiency	%	50%	92%
Therms used per day	Therms	96	52
Cost (per day)	$	$86.37	$46.94

Based on real-world water usage, the current tank system achieves only 50% conversion efficiency (Only 60 cents to every dollar you spend) while Intellihot achieves 92 cents to the dollar.

Based on typical operating conditions (ex. cost of $0.90 per therm), we estimated the gas savings to be $14,390 per year.

In addition to efficiency and gas savings, the Intellihot system has many other advantages:

- *Space Savings* – There is an estimated savings of up to 75% of valuable floor space for the new system.
- *Simplified Piping* – The iQ1501, with an input capacity of over 1500MBH, has simple connections on the back of the unit (inlet/outlet water, gas, venting), so there is less likelihood of piping failures due to multiple connections. This piping scenario also reduces the total amount of piping and the piping and pump systems between the boilers and the large storage tanks.
- *Legionella Reduction* – Due to there being no storage in the system, there is virtually no possibility to legionella in the Intellihot system, so the setpoint can be set lower (~120°F) to save energy and waste.
- *No Single Point Failures / Redundancy* – The iQ1501 has six individual heat exchangers (engines) that communicate with each other but work autonomously. There is no master, so there will be no single point of failure (i.e. pump, single boiler, etc.). The six engines communicate with each other and work together, but should one engine go offline for any reason, then the others will continue to function seamlessly while isolating that specific engine.

If there are any questions or concerns, please contact me.

Respectfully,

Jason W. Smith
Applications Engineer
Intellihot Green Technologies, Inc.
jsmith@intellihot.com