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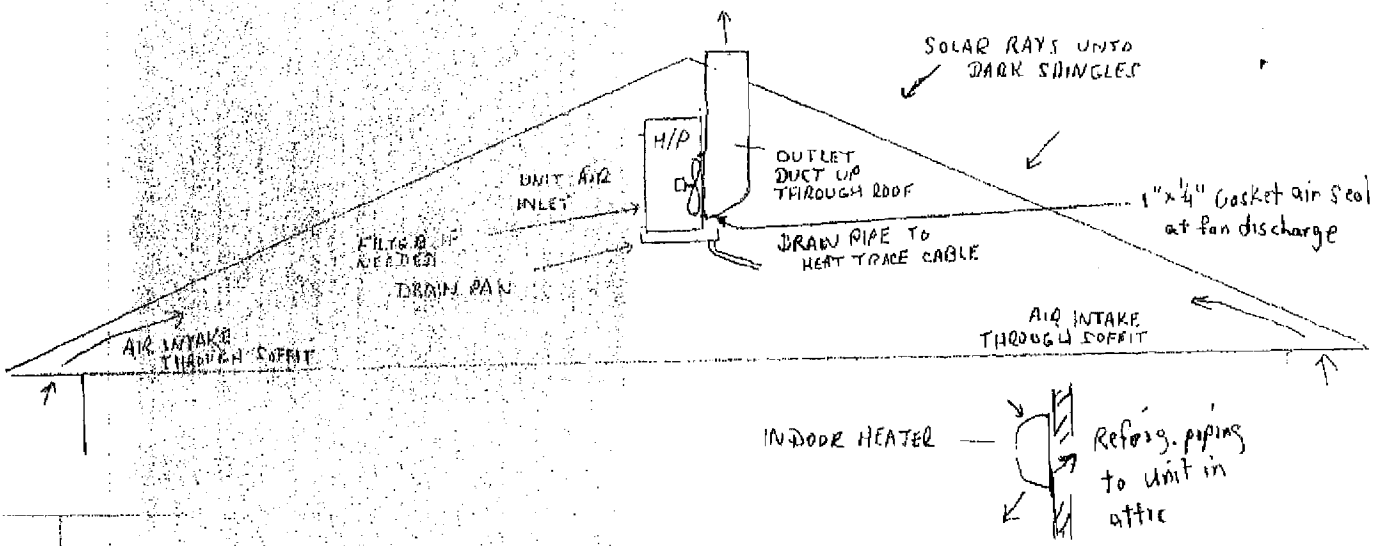
From: Engineering Specialties [mailto:engineeringspecialties@hotmail.com]
Sent: February-29-12 11:07 PM
To: Cheryl Blundon
Subject: MUSKRAT FALLS REVIEW

COMMENTS- ON DOMESTIC HEAT ENERGY AND DEMAND REDUCTION WITH INVERTER HEATPUMPS NON-DUCTED
Our presentation on Feb 21 gave data applicable to out test unit, now operating for the third winter. It was described as an enhanced installation, which has importance for the operating utility as well as the customer for reliable operation down to low winter temperatures without electric back up heaters coming on to satisfy the heating load. We didn't have time to incorporate this method of installation and its many advantages. drg no SK-1 is being sent to you by fax, that you may include it along with our comments. It would be useful for assessment and for others that may want to benefit from this type of energy efficiency and reliability. This may likey be of benefit for others in northern climates.

HEAT PUMP ATTIC MOUNTED FOR ENHANCED OPERATION



H/P- Mini-split heat pump , with inverter type operation, suitable for operation for temperature of 0 F or -18C or for lowest possible ambient conditions for climate of installation

Typical reduction in operating energy compared to electric baseboard heaters is 60 percent if H/P is installed outdoors

Typical reduction in operating energy when installed in a attic with dark colored shingles on the roof is 70 percent reduction for the Avalon region of Newfoundland. This region gets only modest amount of sunshine, more sunny location would get more benefit.

Improvement in performance increases at the rate of 1.4 percent for each 1 degree F that the attic temperature is above the outdoor temperature

Other benefits:

better protected from malfunction during defrost cycles since the unit is protected from high winds ,snow and ice

- better protected from salt corrosion in coastal areas,giving longer life and less trouble.
- fewer defrost cycles as humidity level is usually lower than outdoor near the ground
- recycles energy loss from house interior through the ceiling adding slightly to overall better efficiency

Note: If operating the unit for air conditioning in the summertime, you would need to bring outside air direct to the unit inlet, or the attic temperature may exceed the unit operating temperature in the a/c mode. This is generally not needed for moderate attic temperatures and when seldon used for a/c.

Duct size typical 18 in wide by 12 in deep for unit sized for 20,000btu at 47F

This size unit would give about 3.5 kw of heat at about -12 C, generally good to serve most kitchen /living room areas

Feb. 29/2012	SK-1
BY WINSTON ADAMS	