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Cooling and Air Handling

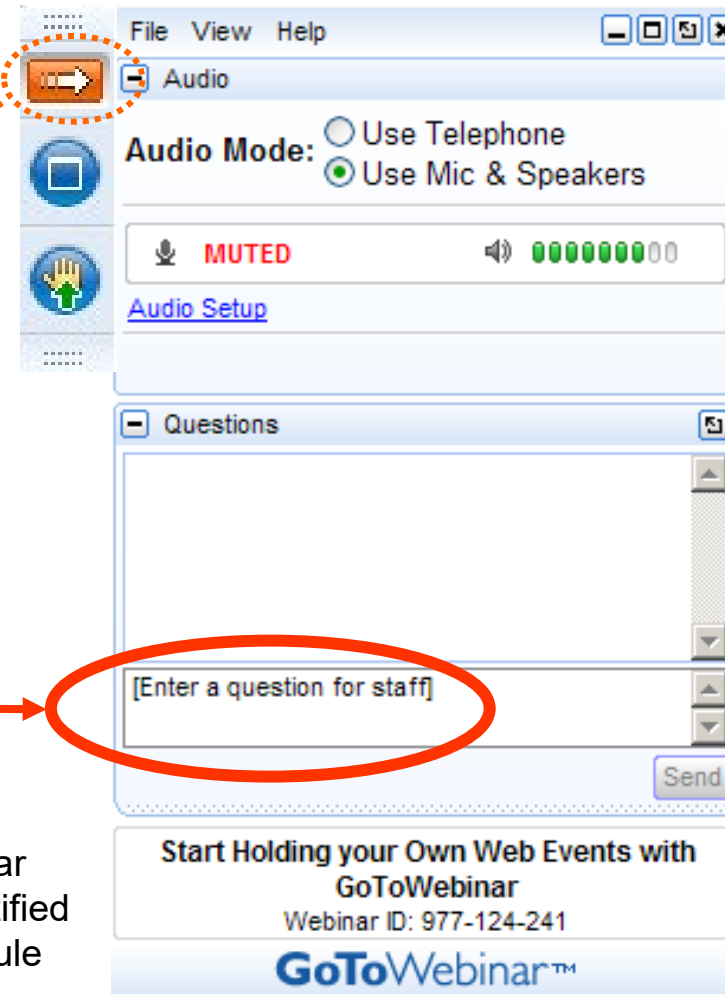
Your questions please?

(if you don't see the control panel,
click on the orange arrow icon to
expand it)

Please enter your questions in the
text box of the webinar control panel
(remember to press send)



Remember: The completion of a Nautel webinar qualifies for ½ SBE re-certification credit, identified under Category I of the Re-certification Schedule for SBE Certifications.



Ideas for things to discuss

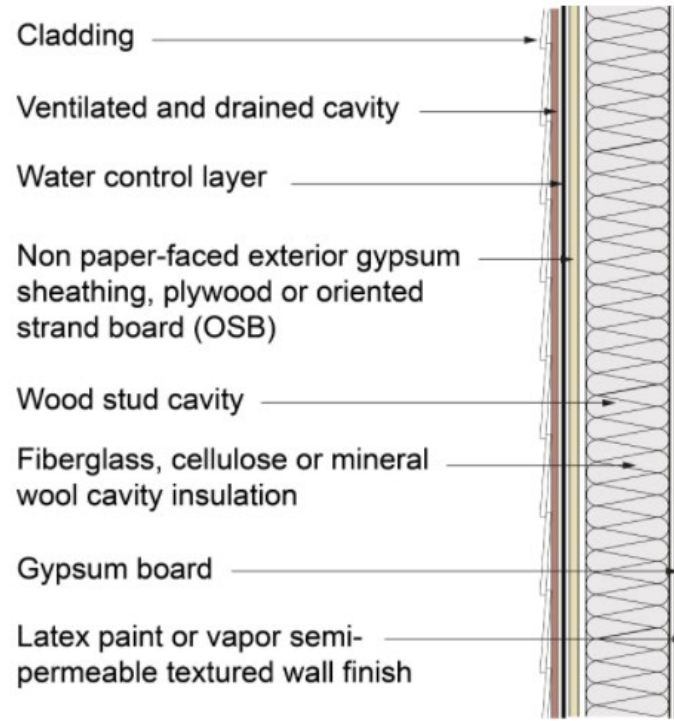
- **Air conditioning or forced air?**
 - Pros and cons
 - Understanding your environment and building
- **Airflow issues**
 - You can have lots of air and still no cooling
- **Long term care**
 - Filters/condenser coils/heat exchangers
- **Other thoughts**
 - How to add redundancy
 - Optimizing the existing facility

Know your environment



<https://www.buildingscience.com/documents/building-science-insights/bsi-120-understanding-walls>

Know your building



Vapor Profile

© buildingscience.com

<https://www.buildingscience.com/documents/building-science-insights/bsi-120-understanding-walls>

Keep it Cool

Calculate transmitter heat load:

$\text{TPO/efficiency} = \text{power consumed} *$

$\text{Power consumed} - \text{TPO} = \text{waste heat (in watts)}$

$\text{Waste heat} * 3.413 = \text{BTU/hr}$

$\text{BTU/hr}/12,000 = \text{tons of AC required}$

Eg: $10\text{kW}/0.72 = 13.889 \text{ kW}$ of power consumption
 $13.889 - 10\text{kW}) = 3888.9 \text{ watts}$ wasted as heat
 $3888.9 * 3.413 = 13,273 \text{ BTU/hr}$
 $13,273/12,000 = 1.11 \text{ tons of air conditioning}$

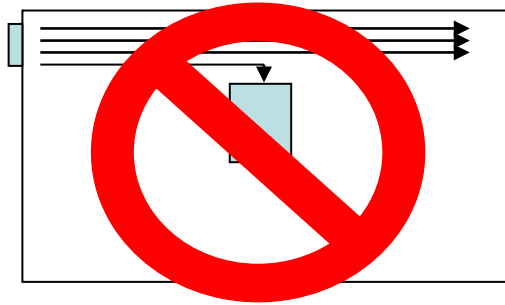
* - allow for modulation in AM transmitters... multiplying by 1.25 will be close

Keep it Cool

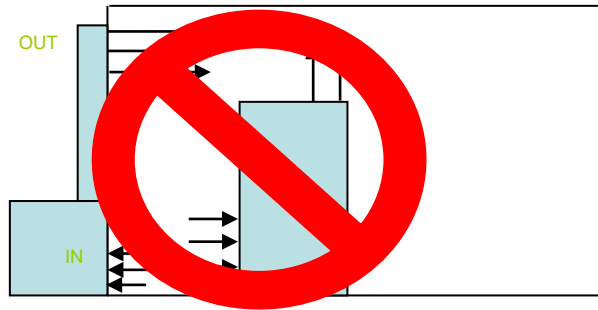
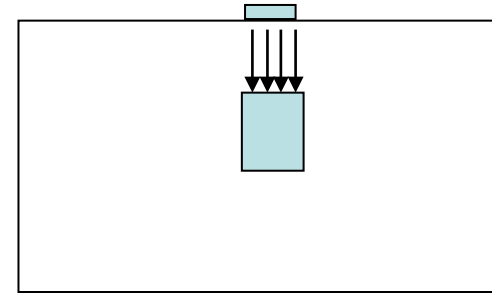
- POSITIVE PRESSURE!
 - More air into building than out of it
 - Allow for transmitter airflow
 - For example, transmitter requires 1500 CFM
 - Bring 3000 CFM of filtered air into building
 - Exhaust 2000 CFM
- If you install louvres in ducting, you can cycle exhaust air into room in winter for heating.

Keep it Cool

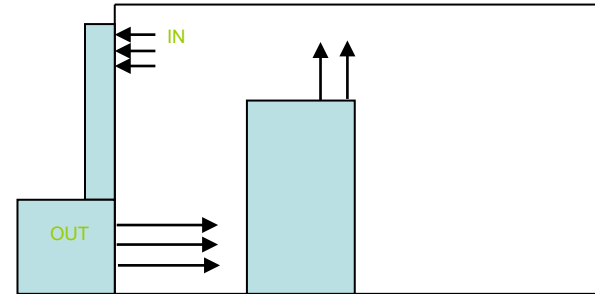
AIRFLOW DIRECTION IS CRITICAL!



TOP
VIEW



SIDE
VIEW



Keep It Cool



- Air Conditioners come in many shapes and sizes (and costs)
- Consider redundancy
 - Size air conditioners at just under the full building heat load and install two, in a main/alternate configuration
- Always take building and environmental heat load into effect. The transmitter, while the primary source of heat, will not be the ONLY source.
- Depending on location, security to protect outside units from copper thieves may be required.

Airflow Considerations

- Airflow is also important
 - As much air as possible should flow through equipment
 - Don't defeat the purpose by reversing direction



Clean equipment is happy equipment



Poor airflow, or insufficient cooling,
can be expensive!!!

Clean equipment is happy equipment



Air filters – on incoming air and equipment – are there to keep things clean

- _They must be cleaned or replaced regularly
- _Equipment should NOT be operated with air filters removed, unless a provisions are in place for additional filtering of incoming air. This is rarely advisable
- _Do NOT replace air filters with a different type without consulting the equipment manufacturer
- _Some air filters require spraying with a sticky substance (FilterKote™) for proper operation

Clean equipment is happy equipment



Cool, clean transmitter sites make for happy transmitters, happy engineers – and happy technical support staff!

Online Information



Webinars

<https://www.nautel.com/resources/webinars/>



Nautel Waves Newsletter

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YouTube

<http://www.youtube.com/user/NautelLtd>

THANK YOU!

