

2002 ASHRAE

Winter Meeting Technical Program

Casino Ventilation

Keeping Gamblers Comfortable

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Passive and Integrated HVAC Systems for Casino IAQ

Part II

IAQ Using Integrated Energy Recovery and Energy Savings

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Outline

- Case study of large casino on Gulf Coast.
- Project Scope.
- Regional Differences between casino in Las Vegas to casino on Gulf Coast.
- Design history and owner changes mid construction.
- Viable solutions to address owners needs.
- Results of solution implementation.

Project Scope

- 1800 Room, 30 story Hotel Tower
- 500,000 SF podium in a two story configuration with mezzanine*
- Limited podium footprint area
- 3 - 50,000 SF “floating” barges connected together containing 5 – 5 star restaurants, 2 – lounges, a pool deck, 70,000 SF +/- casino and BOH areas

Design History

- Accelerated design schedule (what else is new)
- Very tight budget (what else is new)
- Owner brings on contractors early to assist in budgeting.
- Contract signed using developed GMP.
- Central plant equipment ordered based on DD documents.
- Owner decides to add 55,000 SF of mezzanine office space after start of construction.

Issue

**How to add enough tonnage to allow
55,000 SF mezzanine expansion without
increasing central plant**

Regional Casino Comparisons

- Example #1
- 70,000 SF Las Vegas Casino
 - 285,000 CFM
 - 90,000 CFM Outside Air
 - 690 Tons Cooling

Regional Casino Comparisons

- Example #2
- 70,000 SF Gulf Coast Casino
 - 285,000 CFM
 - 90,000 CFM Outside Air
 - 985 Tons

Solution

- Main difference between Las Vegas casino and the Gulf Coast casino is latent load.
- How can latent load be reduced without reducing outside air?
- Look at using desiccant wheel to transfer latent load to “dry” building exhaust.

Results

- Installed 8 - 11,250 CFM desiccant wheels to pre-treat outside air
- Was able to reduce outside air entering db 6 Deg F and entering wb 9 Deg F
- Decrease in total tonnage for casino approx. 300 tons or 1/3
- Outside air CFM was not reduced

Regional Casino Comparisons

- Example #2 (after installing desiccant wheels)
- 70,000 SF Gulf Coast Casino
 - 285,000 CFM
 - 90,000 CFM Outside Air
 - 682 Tons

Conclusion

- CON's
- Wheels are bulky and take up valuable room
- Need to pay attention to building pressurization
- Added first cost
- Slightly more maintenance intensive

Conclusion

- PRO's
- Pre-treating outside air can reduce central plant tonnage
- Desiccant wheels as an option can be used in high humidity areas
- Expand capability of existing central plants
- Simple payback less than 4 years in most instances