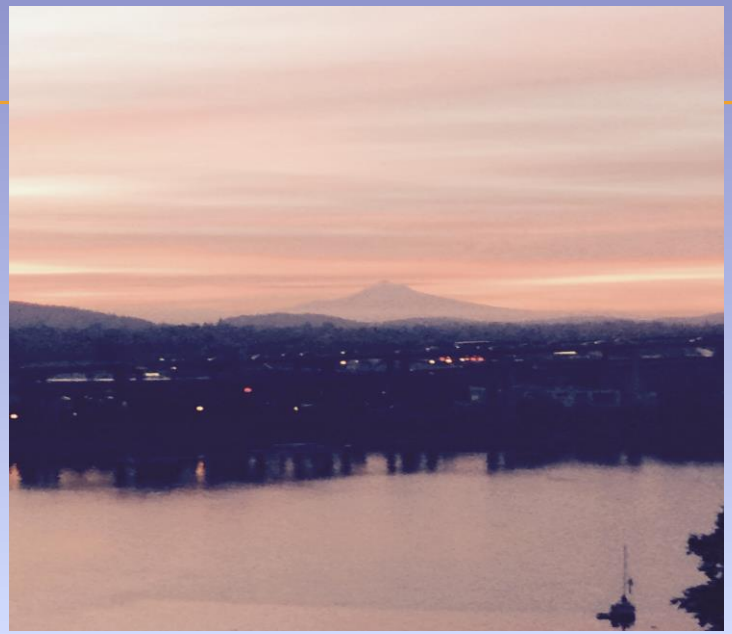

REGULATIONS & GUIDELINES TO FOLLOW! TJC, FGI, AND ASHRAE

William M. Wagner, ScD, CHSP, CHEP, CHCM
Vice President - Quality Compliance
TSIG Consulting, Inc

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DRIVING FORCE

The Joint Commission® Environment of Care Standards-2015

- Minimizing Waterborne Organisms
  (EC.02.05.01 EP14)
- Controlling Airborne Contaminates
  (EC.02.05.01 EP15)
- Providing Appropriate Environment
  (EC.02.06.01 EP13)

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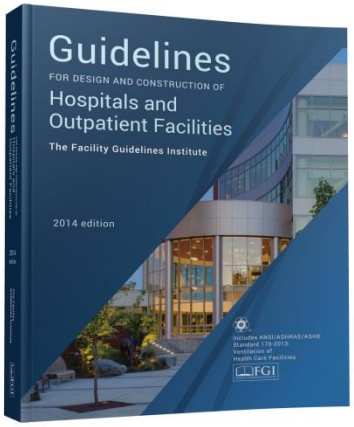
TJC REQUIREMENT

Design Criteria

- *Guidelines for Design and Construction of Health Care Facilities, 2010 edition, administered by the Facility Guidelines Institute and published by the American Society for Healthcare Engineering (ASHE).*

THE GUIDELINE

- Guidelines for Design & Construction of Hospital & Healthcare Facilities, *Facilities Guidelines Institute, FGI 2010*



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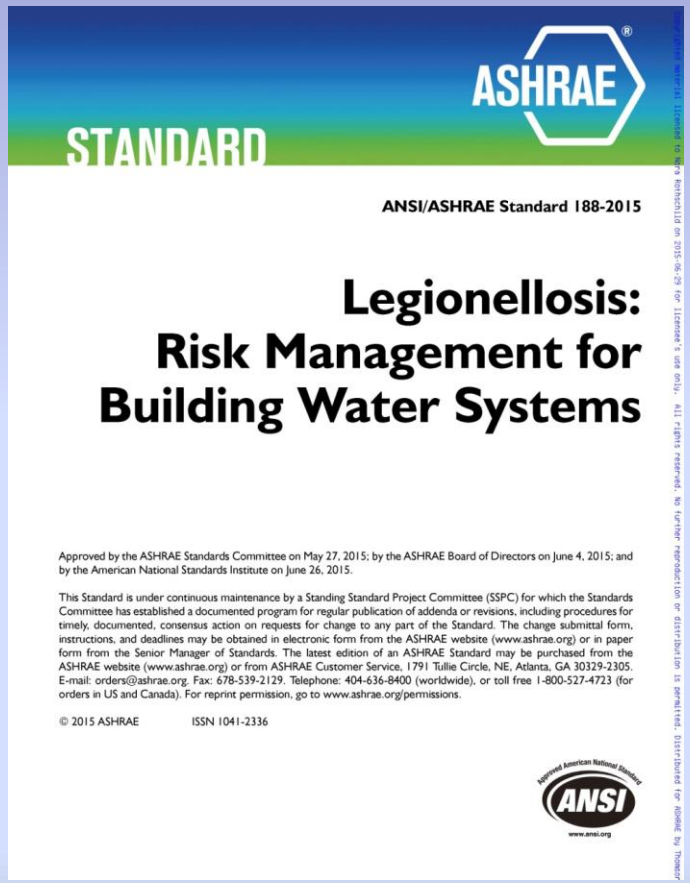
THE GUIDELINES

- Legionella: Risk Management for Building Water Systems *ASHRAE 188-2015*



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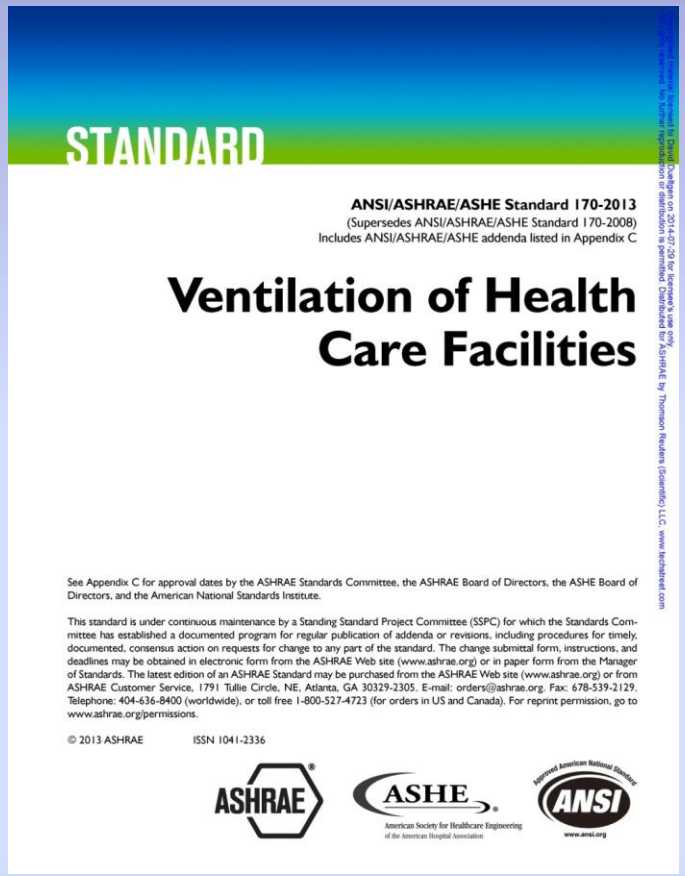
THE GUIDELINES

- Ventilation of Healthcare Facilities *ASHRAE 170-2008*



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KEY RESOURCES

- **Healthcare** - *Guidelines for Environmental Infection Control in Healthcare Facilities*, CDC, 2003

- **Infection Control** - *Infection Prevention Manual for Construction & Renovation,* APIC 2014

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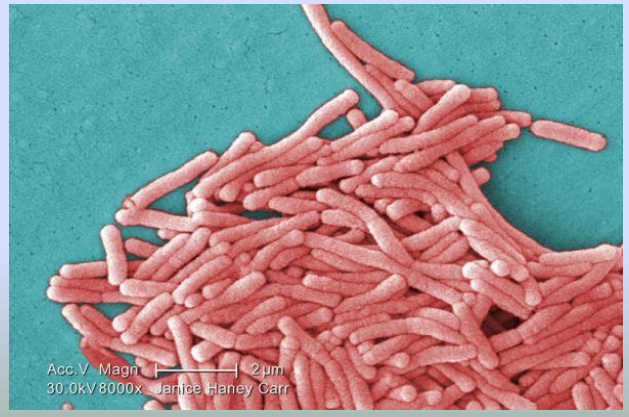
BAD NEWS

Historic New York City hotel located as source of Legionnaires' disease outbreak

"The Opera House Hotel said it will go beyond newly imposed regulations in testing its cooling system as officials declare an end to the outbreak" (NY Times)



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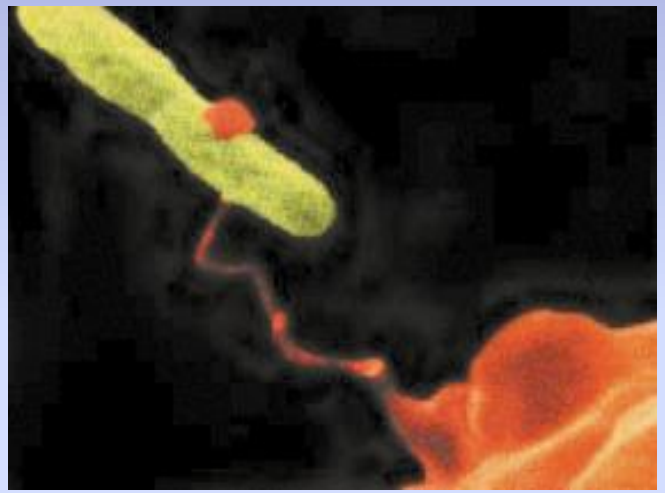
MINIMIZING WATERBORNE ORGANISMS

EC.02.05.01 EP14

- *The hospital minimizes pathogenic biological agents in cooling towers, domestic hot and cold water systems, and other aerosolizing water systems.*



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WATER MANAGEMENT PROGRAM
ASHRAE 188

- Prevention-

  Establishing the program

- Precautions-

  Identifying potential & ongoing risks

- Response-

  Being prepared with corrective actions

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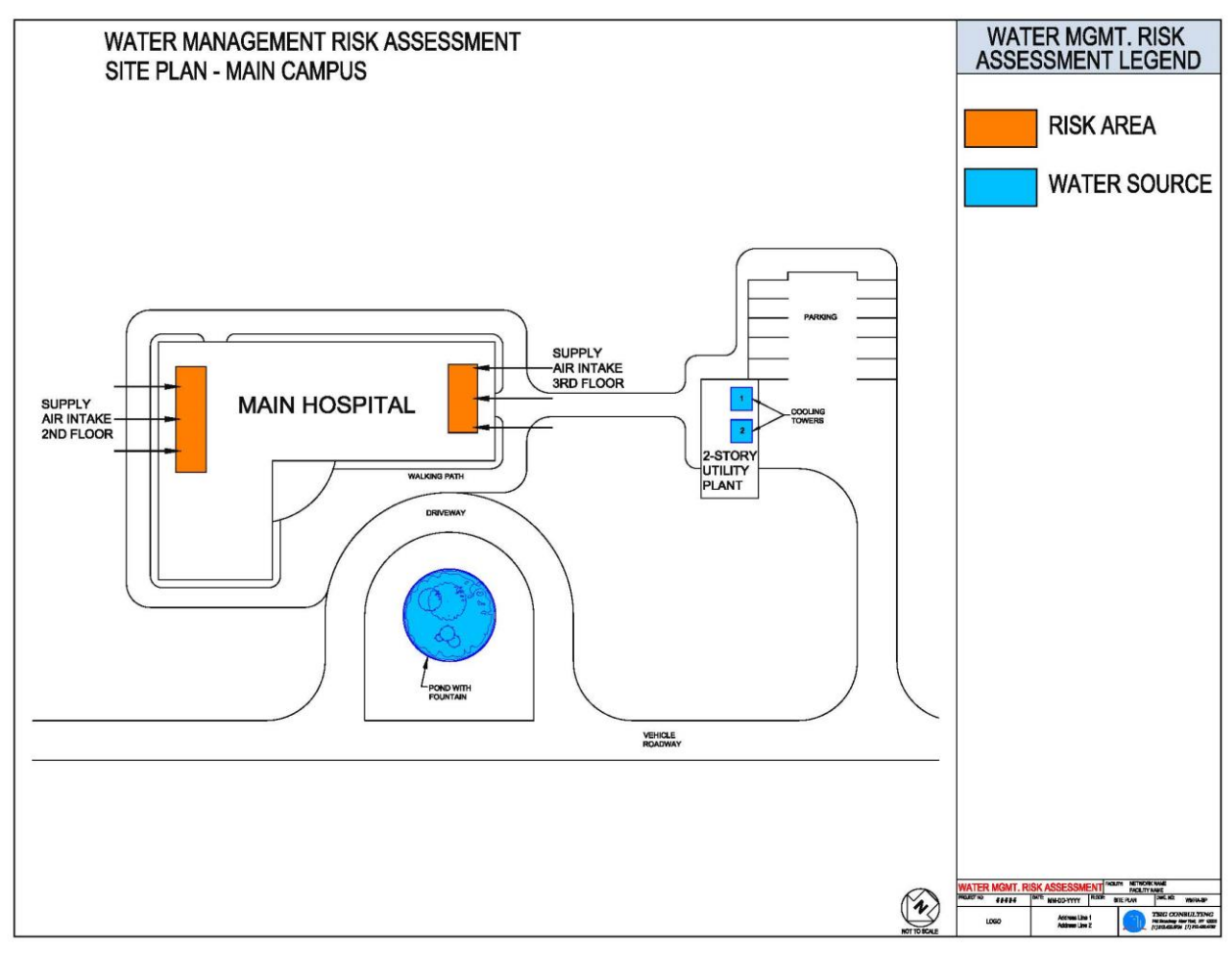
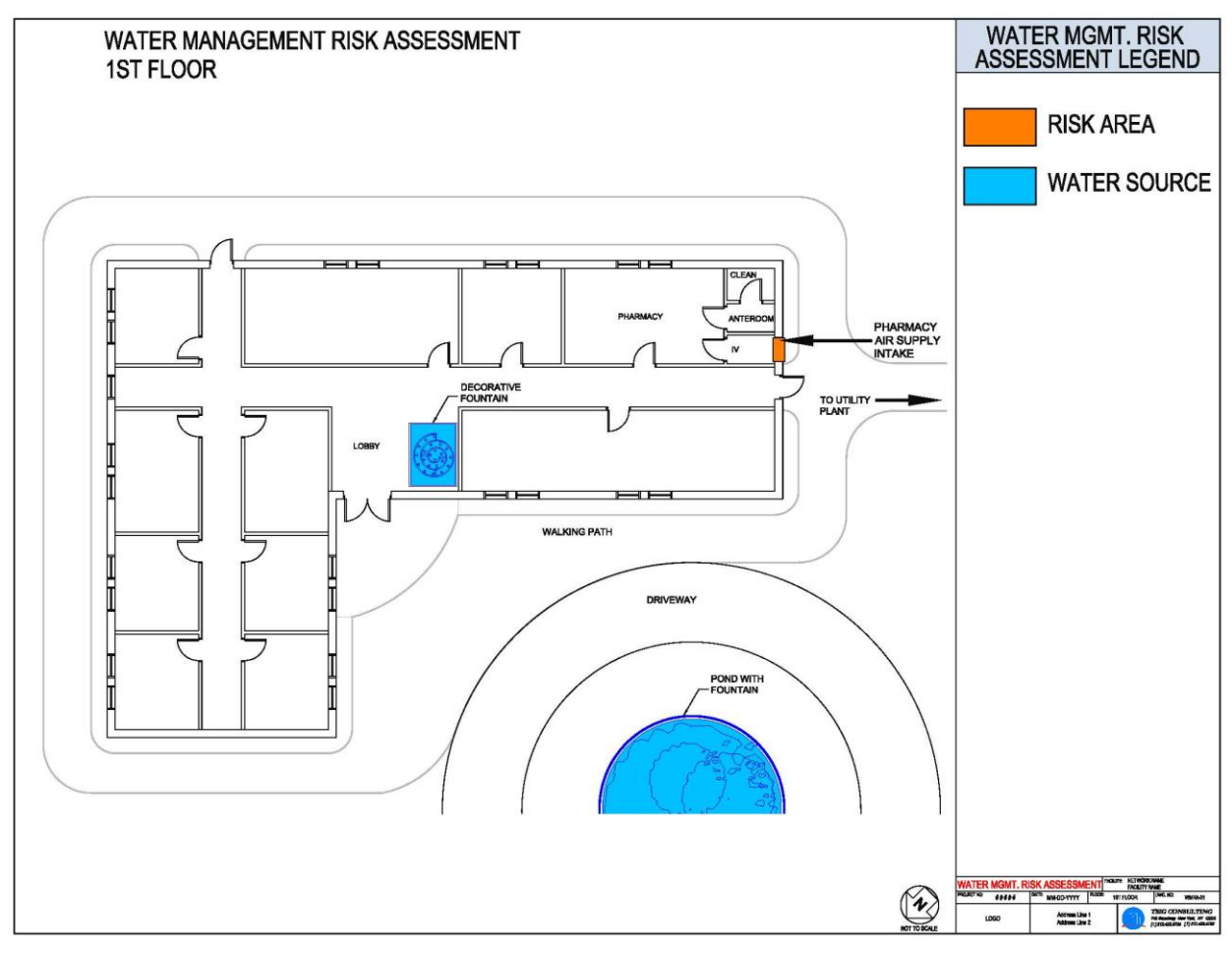
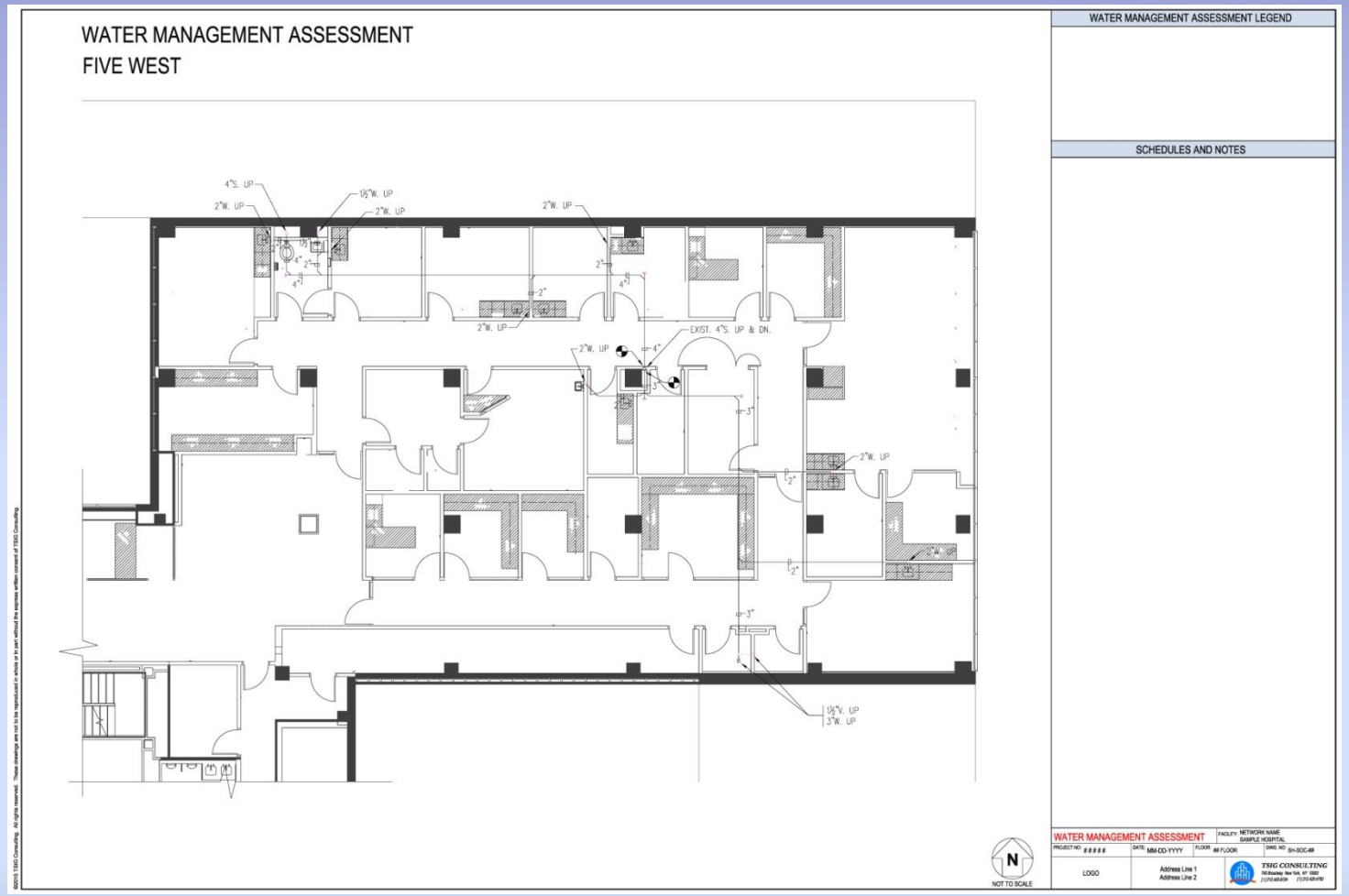
WATER MANAGEMENT AUDIT



WATER MANAGEMENT AUDIT



WATER MANAGEMENT AUDIT



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ANALYSIS

High Risk Areas

- Cooling Towers*
- Hot and Cold Water Loops
- Whirlpools and Spas
- Decorative Indoor Fountains
- Inactive Patient Care Space
- Cardiac Heater-cooler Units

**8.2 Cooling Towers.* Cooling towers shall be located so that drift is directed away from air-handling unit intakes.

CONTROLS

- Identify the “control locations” for risks
- Determine and implement the “control measure” to minimize risk
- Define the “control limits” required
- Monitor the “control measures”

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DOCUMENTATION

- Document the risk analysis
- Identify the “control measures” implemented on drawings
- Monitor the “control limits”
- Record “corrective actions” for deficiencies
- Discuss concerns at EOCC meeting

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PRECAUTIONS

- Spring-cleaning cooling towers
- Reopening closed patient units
- Fixing closed hot water loops
- Cleaning outdoor fountains

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RESPONSE

- Relocate patients
- Decontaminate systems
  - Heat
  - Chemical
- Test system for organisms
- Retreat as required
- Retest until appropriate

CONTROLLING AIRBORNE CONTAMINATES

EC.02.05.01 EP15

- *In areas designed to control airborne contaminants (such as biological agents, gases, fumes, dust), the ventilation system provides appropriate pressure relationships, air-exchange rates, and filtration efficiencies.*

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ENVIRONMENTAL CRITERIA

- Original design of space
- Current clinical function of a space
- Capabilities of the existing utility system
- Utility support for clinical needs of space
- Current infection-related events
- Suitability of space for procedures

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PARAMETERS

- Pressure relationships
- Directional airflow
- Air-exchange rates
- Filtration efficiencies

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AREAS OF CONCERN

- Protective Environments (PE)
- Positive Pressure Areas
- Airborne Infection Isolation Rooms (AIIR)
- Negative Pressure Areas

PROTECTIVE ENVIRONMENTS (PE)

- Operating rooms
- Special procedural rooms
- Neonatal nurseries
- Bone marrow transplants

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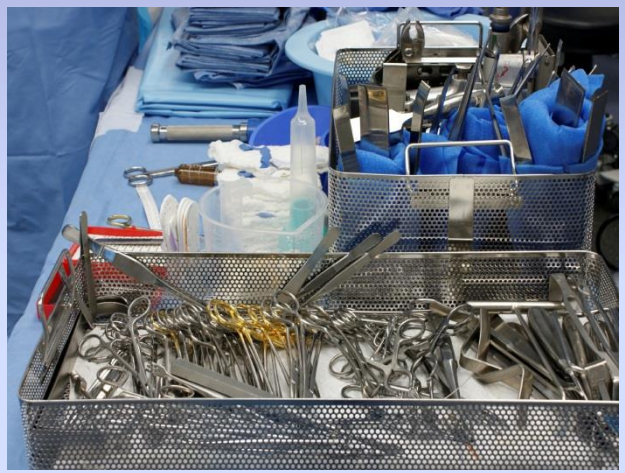
POSITIVE PRESSURE AREA

- Sterile processing
- Pharmacy
- Sterile supplies storage
- Clean storage rooms



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AIRBORNE INFECTION ISOLATION ROOMS (AIIR)

- Contagious patient rooms
- Specific procedure rooms
- Contagious delivery rooms
- Bronchoscopy procedure rooms

NEGATIVE PRESSURE AREAS

- Laboratory
- High-level disinfection areas
- Soiled utility rooms
- Sterile processing (Decontamination area)
- Pharmacy (Hazardous drug prep area)

ASHRAE 170

Function of Space	Pressure	Min OA (ACH)	Min Total Air (ACH)	Air Exhausted	Air Recirculation by local unit
Class B and C operating rooms	Positive	4	20	N/R	No
Class A Operating/Procedure room	Positive	3	15	N/R	No
Airborne Infectious Isolation room	Negative	2	12	Yes	No
Protective environment	Positive	2	12	N/R	No
X-ray (surgery/critical care and catheterization)	Positive	3	15	N/R	No
Bronchoscopy, sputum collection, and	Negative	2	12	Yes	No
ER Waiting Area	Negative	2	12	Yes	No
Laboratory, general	Negative	2	6	N/R	N/R
Pharmacy	Positive	2	4	N/R	N/R
Compounding Pharmacy Hazardous Prep (USP 797-800)	Negative	2	30 (15)	Yes	No (HEPA)
Gastrointestinal Endoscopy Procedure Room	NR	2	6	N/R	No
Endoscope cleaning	Negative	2	10	Yes	No
Soiled or decontamination room	Negative	2	6	Yes	No
Clean workroom	Positive	2	4	N/R	No
Sterile storage	Positive	2	4	N/R	N/R
Soiled linen storage	Negative	N/R	10	Yes	No
Clean linen storage	Positive	N/R	2	N/R	N/R
Janitor's closet	Negative	N/R	10	Yes	No
Hazardous material storage	Negative	2	10	Yes	No

PRESSURE DIFFERENTIAL

- Minimum 0.01” water column

  (FGI 7.2.1-2 & 7.4.1)
- Protective Environments (PE)
- Airborne Infection Isolation Rooms (AIIR)
- Positive or Negative Areas ???

  (Risk assessment)

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DIRECTIONAL AIRFLOW

- Relationship to adjacent areas
- Outward for clean environments
- Inward for dirty environments
- Not a measure of pressure

AIR-EXCHANGE RATES

- Outdoor air exchange
- Exhaust to outdoor
- Minimum requirements

AIR-EXCHANGE RATES CALCULATIONS (FGI 7.1B)

When calculating ACH:

Positive environment, i.e. OR, Sterile Processing Area & Clean Storage

- *measure the air supplied to the space*

Negative environment, i.e. AIIR, Laboratory ER Waiting Room

- *measure the air exhausted from the space*

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FILTRATION EFFICIENCIES

- Design criteria
- Percent efficiency
- Performance maintenance
- Minimum Reporting Efficiency (*MERV*) (0.3 to 10 µm, rating from 1 to 16)

  Bacteria, droplet nuclei (sneeze), cooking oil, most smoke and insecticide dust, most face powder, most paint pigments

  - MERV 13-16 @ 1.0–0.3 µm for Surgery

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COMPLIANCE

- Inventory appropriate spaces
- Classify clinical function (invasive, support, etc.)
- Determine original design of space
- Define capabilities of the utility system
- Conduct a “Ventilation Audit”

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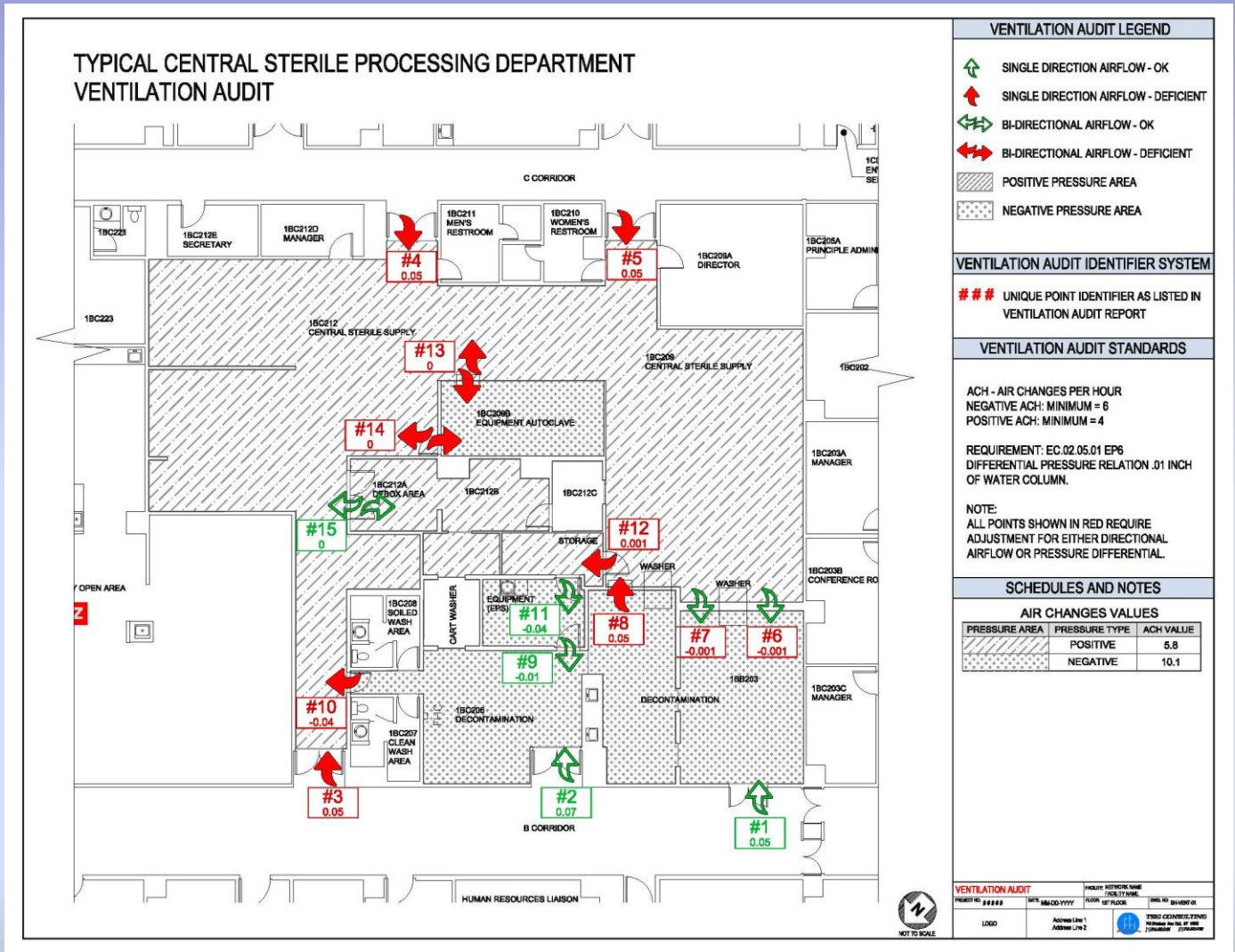
VENTILATION AUDIT



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VENTILATION AUDIT

Ventilation Audit - Central Sterile Supply
General Hospital
November 20, 2014

Points	Location	Adjacent Space	Required Directional Airflow	Measured Directional Airflow	Differential Pressure (" of water)	Corrective Action
#1	B Corridor	Decontamination Area (1BB203)	Positive	Positive	0.02	*None*
#2	B Corridor	Decontamination Area (1BC206)	Positive	Positive	0.02	*None*
#3	B Corridor	Central Sterile Supply (1BC212)	Negative	Positive	0.02	*Pressure adjustment*
#4	C Corridor	Central Sterile Supply (1BC212)	Negative	Positive	0.04	*Pressure adjustment*
#5	C Corridor	Central Sterile Supply (1BC209)	Negative	Positive	0.04	*Pressure adjustment*
#6	Decontamination Area (1BB203) through hole	Central Sterile Supply (1BC209)	Negative	Positive	0.005	*Seal hole*
#7	Decontamination Area (1BB203) through hole	Central Sterile Supply (1BC209)	Negative	Positive	0.003	*Seal hole*
#8	Decontamination Area (1BB203) through window	Central Sterile Supply (1BC209)	Negative	Positive	0.005	*Pressure adjustment*
#9	Equipment Room (EPS)	Storage	Should not be an opening		-	*Remove door and make solid wall*
#10	Central Sterile Supply (1BC212) Hallway	Decontamination Area 1BC206	Positive	Neutral	0.003	*Pressure adjustment Keep door closed*
#11	Decontamination Area (1BC206)	Equipment Room (EPS)	Negative	Negative	0.00	*None*
#12	Central Sterile Supply (1BC209) Wrapping Area	Storage Area	Positive	Positive	0.002	*Increase pressure differential*

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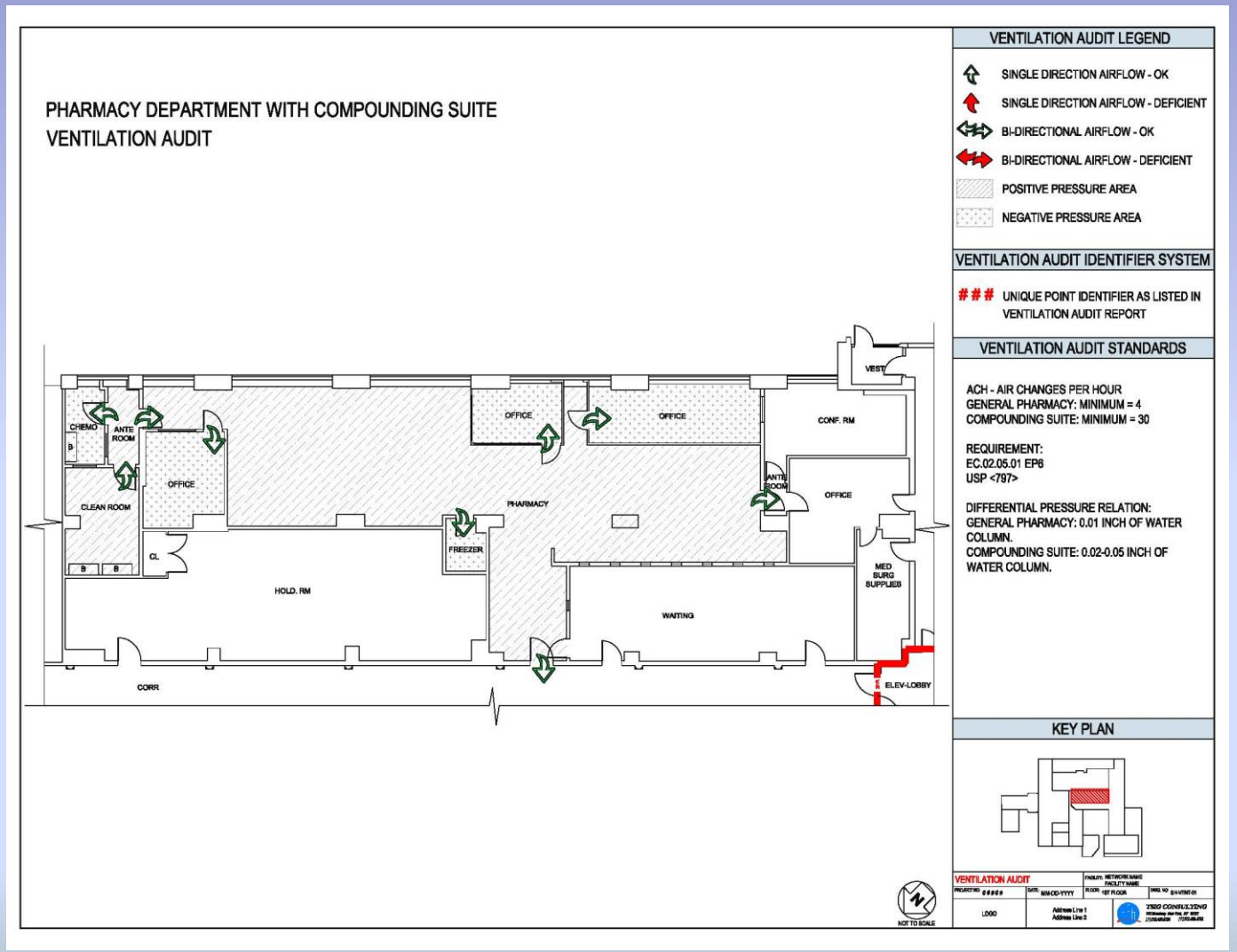
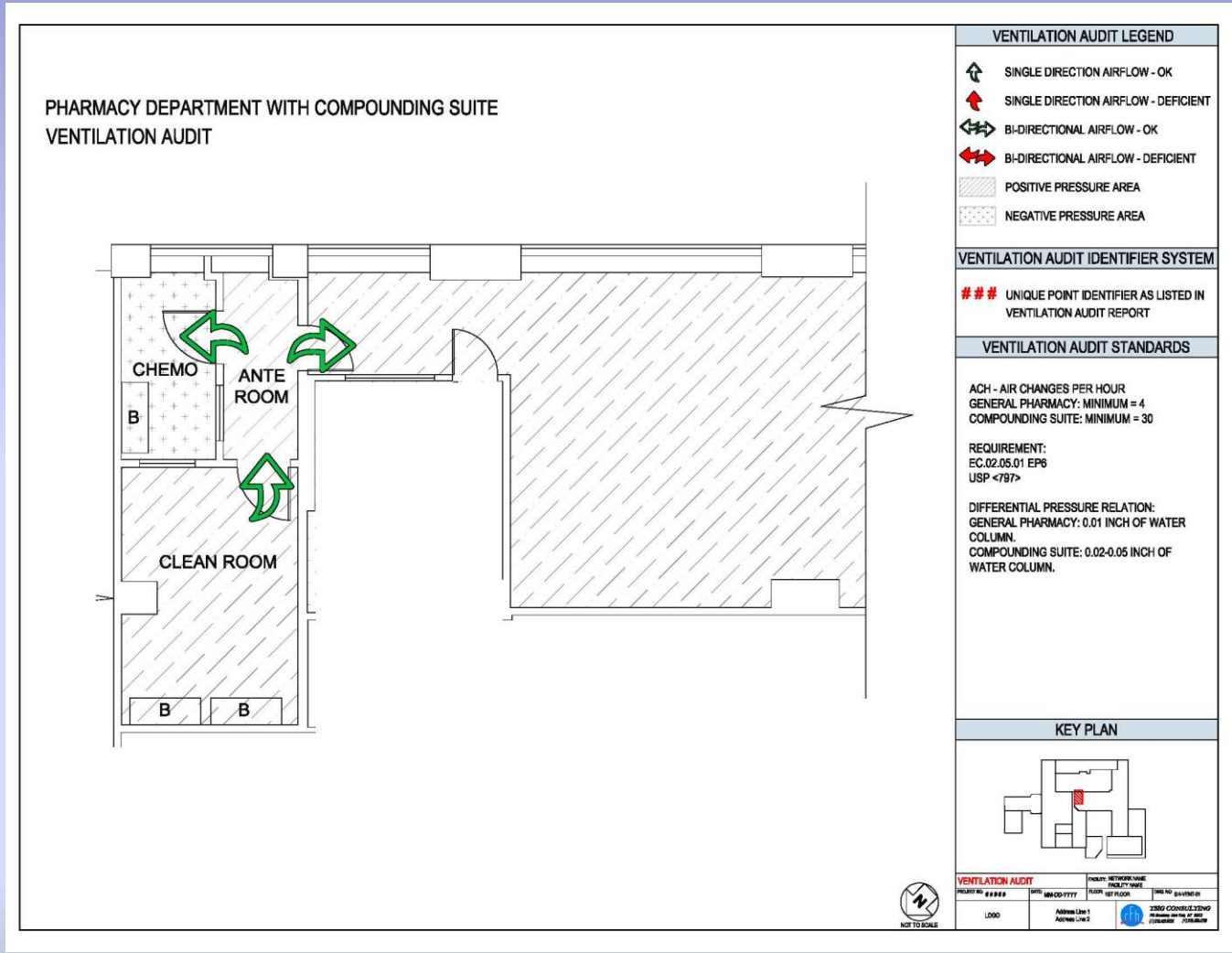
VENTILATION AUDIT



VENTILATION AUDIT



NON-COMPLIANCE

- Identify areas of non-compliance on drawing
- Inspect utility system for problems and correct issues when possible
- Conduct risks assessment with IP and clinical staff
- Implement Interim Patient Safety Measures*

*(cease procedures when appropriate)

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CORRECTIVE ACTIONS

- Determine if space was appropriately designed for current use
- Review the capabilities of utility system
- Develop a PFI with $$$
- Decide if patient care can continue

DEMONSTRATE COMPLIANCE

- Determine appropriate ranges for various areas
- Establish “realistic” monitoring frequencies
- Record the appropriate data
- Document corrective actions
- Calibrate monitors

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TEMPERATURE & HUMIDITY

EC.02.06.01 EP13

- *The hospital maintains ventilation, temperature, and humidity levels suitable for the care, treatment, and services provided.*

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AREAS OF CONCERN

- Surgery
- Nursery
- Invasive Radiology
- Sterile Storage

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TEMPERATURE AND HUMIDITY

Function of Space	Design Humidity (%)	Temp (F)
Class B and C operating rooms	20 - 60	68 - 75
Class A Operating/Procedure room	20 - 60	70 - 75
Airborne Infectious Isolation room	max 60	70 - 75
Protective environment anteroom	N/R	N/R
X-ray (surgery/critical care and catheterization)	20- 60	70 - 75
Bronchoscopy, sputum collection, and pentamidine administration	N/R	68 - 73
Laboratory, general	N/R	70 - 75
Pharmacy	N/R	N/R
Compounding Pharmacy Hazardous Prep	max 60	<= 68
Gastrointestinal Endoscopy Procedure Room	20 - 60	68 - 73
Endoscope cleaning	N/R	N/R
Soiled or decontamination room	N/R	72 - 78
Clean workroom	max 60	72 - 78
Sterile storage	max 60	72 - 78
Soiled linen storage	N/R	N/R
Clean linen storage	N/R	72 - 78
Janitor's closet	N/R	N/R
Hazardous material storage	N/R	N/R

HUMIDITY CONCERNS

CMS Condition of Participation -
Memorandum Summary: Anesthesia

- S&C 13-25 April 13, 2013
  - Reduced humidity level for 35% to 20%
- S&C 15-27 February 20, 2015
  - Re-established earlier level based on *Quality Advisory*- January 21, 2015 for IFU

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ASSESS EQUIPMENT AND SUPPLIES

- Identify area where anesthesia is used
  - Surgery, Invasive Radiology, etc.
- Classify items used in area of anesthesia
  - In-use or storage
- Review manufacturer's IFU
  - Medical equipment & surgical supplies
- Review packaging of supplies
  - Duration of supplies in low humidity area

DEMONSTRATE COMPLIANCE

- Determine appropriate ranges for various areas
- Establish “realistic” monitoring frequencies
- Record the appropriate data
- Document corrective actions
- Calibrate monitors

DOCUMENTATION

- Policy on acceptable ranges, monitoring frequency & required corrective actions
- Policy developed by clinical, IC and FM
- Data of monitoring with readings
- Records of corrective actions

CONSENSUS

Joint Interim Guidance:

HVAC in the Operating Room and Sterile Processing Department

September 21, 2015

- Design- FGI & ASHRAE
- Operational – AAMI & AORN

There is a difference based on clinical need!!!

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SUMMARY

Infection Prevention and Facilities Management must focus on the good of the patient!!!

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QUESTIONS

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Vice President Quality Compliance
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