

Developing a

"Comprehensive Environmental Infection
Control Compliance"

Strategy

Welcome!!



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As Director of Client Relations, Business Development & Marketing I have been blessed to become a part of the CEPro Inc. team whose business offering serves Healthcare, Laboratory and Cleanroom critical environments compliance to ensure safety, productivity and clients mission/vision.

Trusted advisor in Healthcare, Laboratory and Cleanroom critical environments business strategy....



Healthcare Ventilation Compliance Consult...



Environmental Infection & Quality
Control Compliance





Sailing - Monroe Harbor





HVAC Engineers

Educators

SOP Developers

Test & Balancers



Healthcare
Unique Value Proposition

Automation Calibration Tech's

Energy Engineers

Cleanroom
& Lab
Design
Builders

Business Strategy Consulting

Education

Certification Compliance



Assessment

Healthcare
Unique Value Proposition

Commission

Design Energy Efficiency

Remediate
Budget
Build

The Affordable Care Act

Why Focus on Hospital Acquired Conditions?



There were an estimated 722,000 HAIs in U.S. Acute-Care Hospitals in 2011.



About 75,000 hospital patients with HAIS died during their hospitalizations.

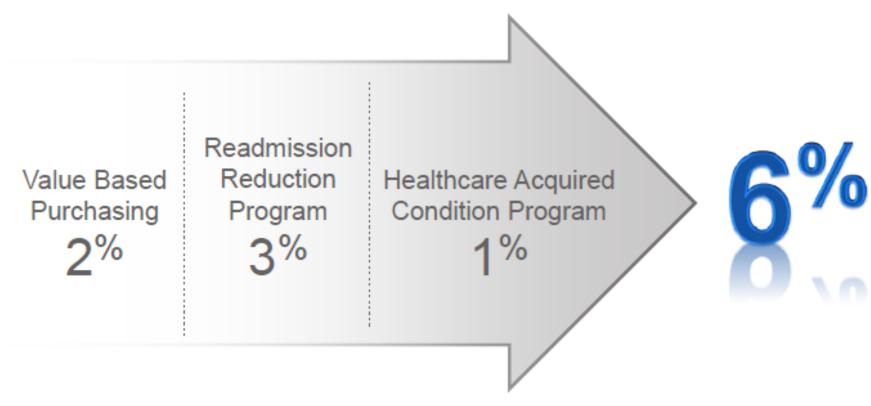


About 1 in 25
hospital patients
has at least one healthcareassociated infection



More than half of all HAIS occurred outside of the intensive care unit.

Percent of CMS Dollars at Stake by FY 2017



.... "an evolving landscape of healthcare that includes, among other changes, the institution of the Affordable Care Act, fluctuations in Medicare and Medicaid reimbursement, and the adoption of risk-based contracting."

The Advisory Board Company, Healthcare Industry Committee. Hospital Value-Based Purchasing. C-Suite Cheat Sheet Series. August 2013.

The Advisory Board Company, Healthcare Industry Committee. Hospital Readmissions Reduction Program. C-Suite Cheat Sheet Series. August 2013.

The Advisory Board Company, Healthcare Industry Committee. Hospital-Acquired Condition Reduction Program. C-Suite Cheat Sheet Series. August 2013.

Infectious Disease Prevention Financial Implications





PMC

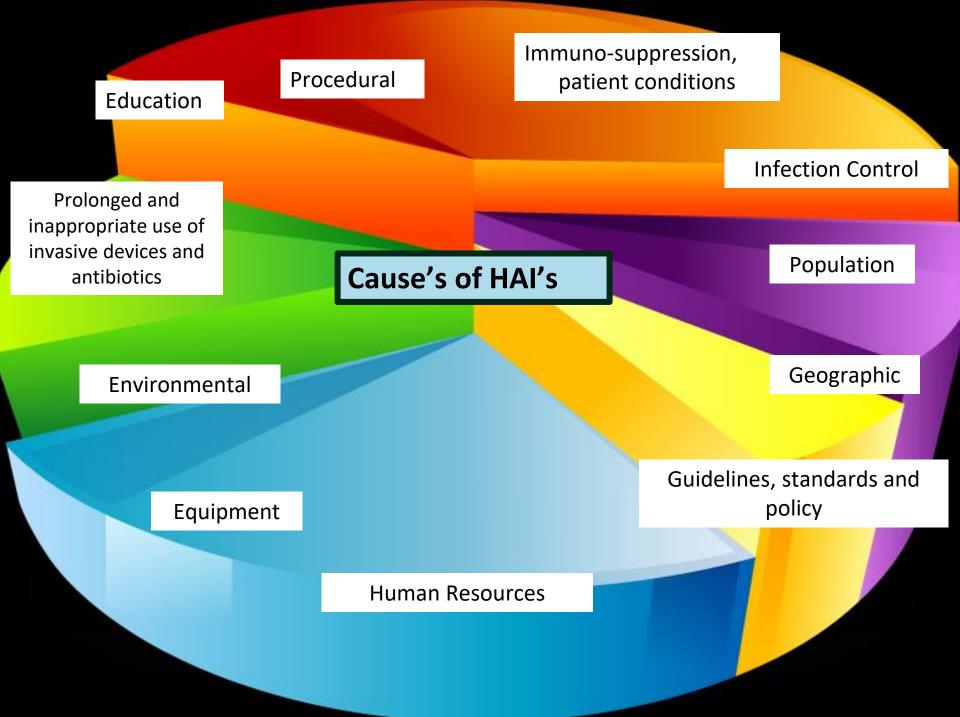
PMC is a free full-text archive of biomedical and life sciences journal literature at the U.S. National Institutes of Health's National Library of Medicine (NIH/NLM).



CMS Changes in Reimbursement for HAIs

The Centers for Medicare and Medicaid Services (CMS) promulgated regulations commencing October 1, 2008, which deny payment for selected conditions occurring during the hospital stay and are not present on admission. The new CMS policy involve healthcare-associated infections (HAIs), which are a common expensive, and often preventable cause of inpatient morbidity and mortality. Approximately 2 million patients per year develop HAIs, or about 5% of acute hospital admissions. The last decade alone has seen an estimated 36% increase in HAIs. The estimated 100,000 deaths per year associated with HAIs rank this as the sixth leading cause of death in the United States. In a recent study capturing additional underlying expenses, the excess hospital cost of HAIs across the nation was estimated to be between 28 and 45 billion dollars annually.

\$35B divided by ~ 5,000 hospitals = \$7M per year per hospital!times how many hospitals in your system?



THE DIRECT MEDICAL COSTS OF

Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention

Description:

"This report uses results from the published medical and economic literature to provide a range of estimates for the annual direct hospital cost of treating healthcare-associated infections (HAIs) in the United States. Applying two different Consumer Price Index (CPI) adjustments to account for the rate of inflation in hospital resource prices, the overall annual direct medical costs of HAI to U.S. hospitals ranges from \$28.4 to \$33.8 billion (after adjusting to 2007 dollars using the CPI for all urban consumers) and \$35.7 billion to \$45 billion (after adjusting to 2007 dollars using the CPI for inpatient hospital services). After adjusting for the range of effectiveness of possible infection control interventions, the benefits of prevention range from a low of \$5.7 to \$6.8 billion (20 percent of infections preventable, CPI for all urban consumers) to a high of \$25.0 to \$31.5 billion (70 percent of infections preventable, CPI for inpatient hospital services)." - summary



Centers for Disease Control and Prevention

CDC 24/7: Saving Lives, Protecting People™

Healthcare-associated Infections

Steps can be taken to control and prevent HAIs in a variety of settings. Research shows that when healthcare facilities, care teams, and individual doctors and nurses, are aware of infection problems and take specific steps to prevent them, rates of some targeted HAIs (e.g., CLABSI) can decrease by more than 70 percent. Preventing HAIs is possible, but it will take a conscious effort of everyone-clinicians, healthcare facilities and systems, public health, quality

improvement groups, and the federal government-working together toward improving care, protecting patients, and saving lives.



Infectious Disease Prevention

- ✓ Airborne/Environment Compliance Strategy Benefits
 - Decreased Healthcare Associated Conditions
 - Maintain high level of Patient Quality care
 - Increased Healthcare Worker Safety
 - Maintain Revenues/Low Investment/High Return
 - Clinical alignment
 - Reduction of operational costs with increased efficiencies
 - Standardized Quality Control Process & Reporting
 - Job security and satisfaction





Healthcare

- Environmental Infection Prevention/Control Compliance
- Lab and Cleanroom contamination prevention

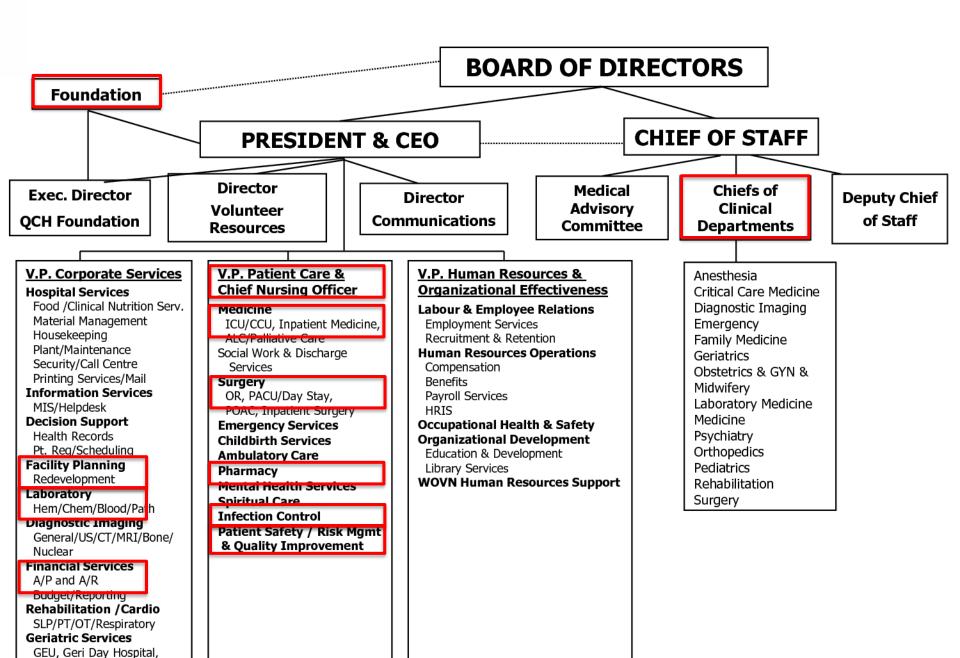


- → Emergency Patient Parking
- ↑ Main Entrance
- → Physician Parking



Developing a Comprehensive "Environmental Compliance Infection & Quality Control" Strategy

- <u>Training</u> and <u>Collaboration</u> Senior Leadership Sponsor recommended
- IP/C Risk Assessment & Inventory
 - ✓ Team Assignment
 - ✓ Identification of <u>Critical Function Space & Systems</u>
 - ✓ EOC Virtual Tour
- Compliance <u>Testing</u>
 - √ Testing Scope & Baseline Agreement
 - ✓ Scheduling
 - ✓ Quality Management Toolset
- Correction of Deficiencies
 - ✓ Expedite, Develop & Implement Plan for Improvement
 - Codes, Standards, Guidelines Referenced
 - ✓ Re-Balancing
 - ✓ <u>Calibration</u> of Automation/Temperature & Vent Controls
 - ✓ Design/Budget/Build
 - ✓ New Construction/Renovation ICRA Process Support
 - ✓ Energy Efficiency Focused
 - ✓ Continuous Commissioning
- Closing the Loops
 - ✓ Documentation Hard Copy and/or On-Line/Cloud based Technology Database
 - ✓ Process Review
 - ✓ Success Metrics documented
- Low Investment, High Return



S:/Organizational Chart: March 2007

GAOT

ASHE Letter from the President



Mark A. Kenneday, MBA, CHFM, FASHE ASHE President

s health facility professionals, we have a responsibility to ensure our organizations' missions are supported with facilities that exceed expectations. To meet these demands, we must prepare ourselves both technically and professionally.

The first step is to define our responsibilities with respect to the executive team's expectations. Understanding the desired future state and the resources required to meet these needs is the pathway to higher achievement.

C-Suite expectations have become more challenging over time.

- ☑ Clinical engineering
- ☑ Codes and regulations
- ☑ Emergency management
- ☑ Environmental services
- ☑ Financial management
- ☑ Grounds
- ☑ Life safety
- ☑ Operations and maintenance
- ☑ Performance improvement
- ☑ Planning, design, and construction
- ☑ Real estate management
- ☑ Security
- ☑ Utilities

Healthcare Infection Control/Prevention





Centers for Disease Control and Prevention

CDC 24/7: Saving Lives. Protecting People.™





THE AMERICAN INSTITUTE
OF ARCHITECTS















APIC* Spreading knowledge. Preventing infection.

Association for Professionals in Infection Control and Epidemiology















Healthcare Success Stories

to duplicate in your operations







Presence Health



University of Illinois
Hospital & Health Sciences System
Changing medicine. For good.





Today counts.





Advocate Health Care

















Adventist **Bolingbrook Hospital**

Keeping you well







2014 FGI Guidelines Update Series

FGI Guidelines Update #1

July 11, 2013

Designing for Safety

Ellen Taylor, AIA, MBA, EDAC

In 2010 one of the topics introduced to the *Guidelines for Design and Construction of Health Care Facilities* was a patient safety risk assessment. However, as a brief section in the appendix, this assessment was not a requirement. In 2014 the *Guidelines* will require a safety risk assessment (SRA) that includes an overarching risk identification process, with considerations for infection control, patient handling, falls, medication safety, psychiatric injury, immobility, and security. This requirement (and related recommendations) is included in Part 1 of the *Guidelines* (Planning, Design, Construction, and Commissioning) with additional requirements and recommendations specific to facility types in Part 2 (Hospitals) and Part 3 (Outpatient Facilities). The purpose of the SRA requirement is to help foster a proactive approach to patient and caregiver safety by mitigating risks from the physical environment that could directly or indirectly contribute to harm.

Infection Control Risk Assessment

INSTRUCTIONS: Evaluate every potential event in each of the three categories of probability, risk, and preparedness. Add additional events as necessary.

- Issues to consider for probability include, but are not limited to: Known risk, Historical data and National Healthcare Safety Network
- Issues to consider for risk include, but are not limited to: Threat to life and/or health, Disruption of services, Damage/failure possibilities, Loss of community trust, Financial impact, and Legal issues.
- Issues to consider for preparedness include, but are not limited to: Status of current plans, Training status, Infection Control resources.
 Multiply the ratings for each event in the area of probability, risk and preparedness. The total values, in descending order, will represent the events most in need of organization focus and resources for planning. Determine a value below which no action is necessary.

EVENT	PROBABILITY			RISK					PREPAREDNESS			TOTAL	
	HIGH	MED	LOW	NONE	LIFE THREAT	HEALTH/ SAFETY	HIGH DISRUP- TION TO UNIT	MOD DISRUP- TION TO UNIT	LOW DISRUP- TION TO UNIT	POOR	FAIR	GOOD	
SCORE	3	2	1	0	5	4	3	2	1	3	2	1	
Geographic Location/ Bioterrorism			Į.		,					,			
Natural disaster			X		X					X			15
Breakdown of municipal services contamination of food or H ₂ O			X		×					×			15
Novel communicable disease Outbreak			X		X					X			15
Public Health/ Outbreaks of transmissible diseases													
Influenza			X			X						X	4
18			X			X						X	4
Legionella		X				X						X	8
Meningitis			X			X						X	4
SID's		X				X						X	8
Foodborne illness Norovirus			X			, ,						- X	4
												· •	4
Bed Bugs Scables		X						X				- X	
Chickenpox			- X			, ,				\vdash		- č	4
Pertussis			X			· ·						÷	8
1 61(03313		X				^						X	0

EVENT	PROBABILITY			RISK					PREPAREDNESS			TOTAL	
	HIGH	MED	LOW	NONE	LIFE THREAT	HEALTH/ SAFETY	HIGH DISRUP- TION TO UNIT	MOD DISRUP- TION TO UNIT	LOW DISRUP- TION TO UNIT	POOR	FAIR	GOOD	
SCORE	3	2	1	0	5	4	3	2	1	3	2	1	
Organizational Programs & Services													
Cardiovascular Service		X				Х						Х	8
Ortho Service	X					X				X			38
Barlatric			Х			X						Х	4
Oncology	X					X						х	12
Neuro Science	Х					X				X			36
Pediatrics		X				X						X	8
Neonatology	X					X						Х	12
Dialysis		X				X					X		16
Rehab Services		X				X						X	8
Ambulatory Surgery	X					X				X			38
Gillab	X					X					X		24
Interventional Radiology		X				X						Х	8
Behavioral Health			X			X						X	4
Women Health		X			l	х				l	X		16
Emergency Room	Х					Х					Х		24
Wound Center			X			X						Х	4
Yacktman			X			X						X	4
Breast Center		X				Х					X		16
Plastic (reconstruction)			X			X					Х		8
CORF			Х			Х						Х	4
Anesthesia		X				X					Х		18
High Risk Patients													
SICU		X			X							Х	10
MICI		X			x							х	10
PICU		X			X							Х	10
NICU		X			X							Х	10
Oncology (8T, Pediatrics)	X				X							х	15
Orthopedics	X				X							Х	15
Cardiovascular		Х			X							X	10
Barlatric LTAC/8NF			Х		X					X			15
	X				Х						X		30
Employee Risks													
Understanding disease transmission & prevention			x			x						x	4
PPE Compliance	X					X					X		24
Hand Hygiene Compliance	X					X					Х		24
Standard Precautions		X				Х					X		16
Airborne Precautions			X			X						X	4
Droplet Precautions		X			<u> </u>	X	<u> </u>	L			X		16

Contact Precautions		X				X					Х		16
Sharps Exposures		X				X				X			24
Communicable Disease Exposure		X				X					х		18
Splash Exposures		Х				Х					Х		18
EVENT		PRO	BABILIT	Y		RISK					PREPAREDNESS		
	HIGH	MED	LOW	NONE	LIFE THREAT	HEALTH/ SAFETY	HIGH DISRUP- TION TO UNIT	MOD DISRUP- TION TO UNIT	LOW DISRUP- TION TO UNIT	POOR	FAIR	GOOD	
SCORE	3	2	1	0	5	4	3	2	1	3	2	1	
HAI Potential													
881	1												
o KPRO/HPRO	х					х				I	Х		24
 Fusions / Refusions - spine 	X					X				х			36
 CABG/CV 			X			X					Х		8
o COLO	X					X				X			38
 HYST/CSEC 		X				X					Х		16
o VSHN		X				X				X			24
VAP/VAE			X			X						X	4
CLABSI			X			X						X	4
CAUTI	X					X					Х		24
Clostridium Difficile		X				Х						X	00
MDRO	X					X					X		24
Communication													
Lack of notification of Isolation-Transport		х				х					х		18
Lack of Patient/family Education	X					х				Х			36
Environment													
Inappropriate handling of biohazard waste			х			х						x	4
Ineffective construction planning		х				Х						х	8
Improper cleaning/disinfection of environment			х			х						x	4
Improper cleaning/disinfection of equipment		х				х					х		18
Water Management		х			1	x	1	1				X	8
Air Management		X			1	X	1	1			Х		18
Реминиципал			х			Х						X	4

Accreditation & Certification documentation









......accreditation and certification is recognized nationwide as a symbol of quality that reflects an organization's commitment to meeting certain performance standards

.....improve health care for the public, in collaboration with other stakeholders, by evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value.









Top 10 Deficiencies found:

		. •	
	Standard	Standard Topic	1/1/2014 – 7/1/2014 Non-Compliance
	EC.02.05.01	Utility System Risks	53%
^	LS.02.01.20	Means of Egress	52%
	EC.02.06.01	Built Environment	51%
Unito	EC.02.03.05	Fire Safety Systems	50%
Up to # 2	IC.02.02.01	Infection Control	50%
	LS.02.01.10	General Requirements	49%
,	RC.01.01.01	Record of Care	49%
	LS.02.01.30	Protection	46%
	LS.02.01.35	Extinguishment	44%
	EC.02.02.01	HazMat & Waste	36%



EC.02.06.01 EP 13

- EP 13 The organization maintains ventilation, temperature and humidity levels suitable for the care, treatment and services provided
 - Ventilation:
 - i.e. doors held open by air pressure; odors
 - Temperature:
 - Hot / Cold calls
 - Humidity
 - Primary concern is for areas >60%RH
 - Mold growth is possible
 - EP 20 Patient care areas are clean and free of offensive odors



#4 EC.02.05.01 EP 6

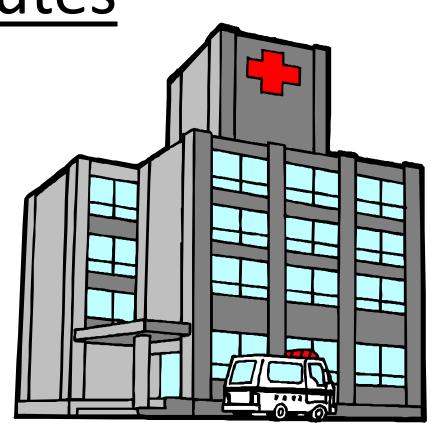
- Ventilation system is unable to provide appropriate pressure relationships, air-exchange rates and filtration efficiencies
 - Specific areas lack
 - negative or positive pressures in relationship to adjacent areas
 - i.e. Endoscopy Processing Room should be negative to the egress corridor
 - the correct number of air changes per hour
 - Improper filtration
 - MERV = minimum efficiency reporting value



Infection Transmission

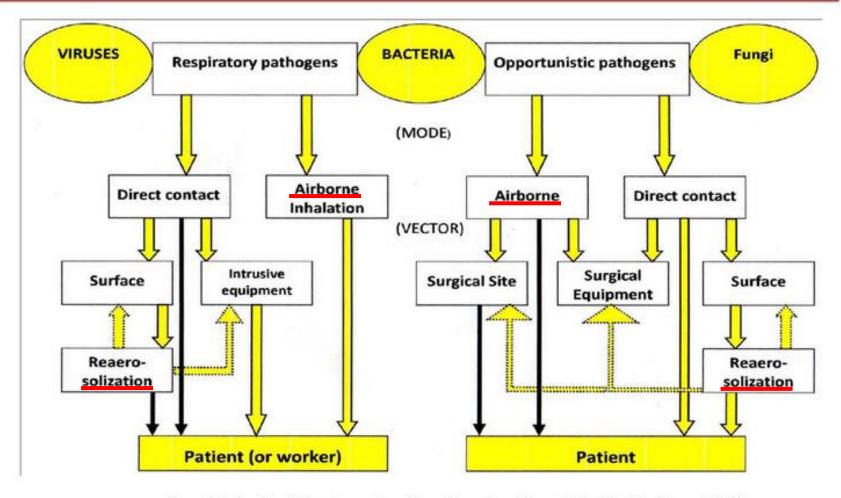
Routes

- Airborne
- Surfaces
- Water

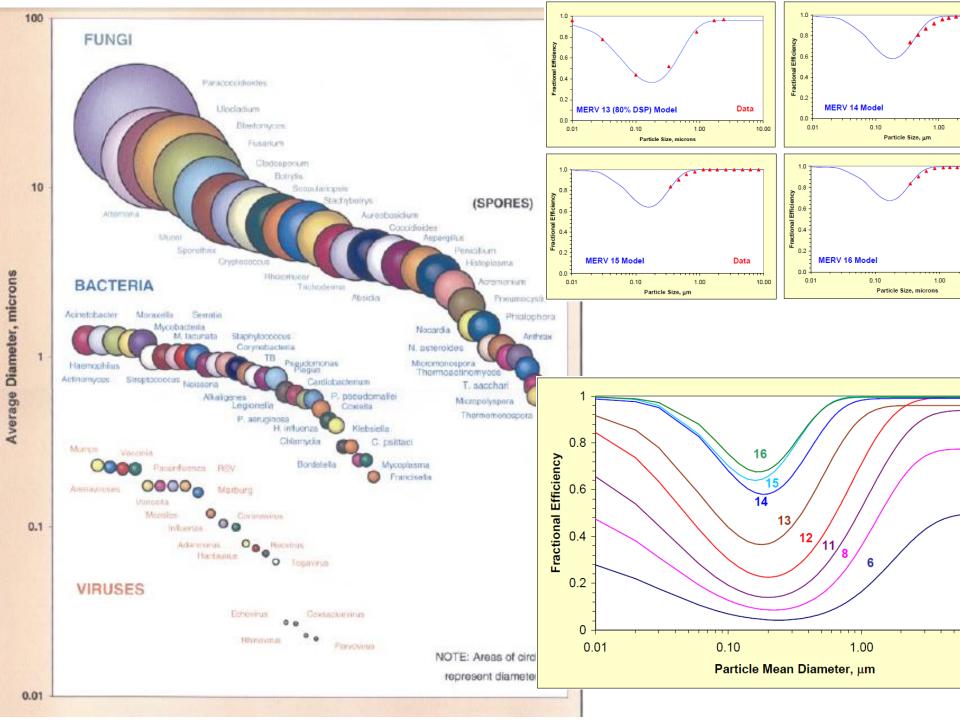


Healthcare facilities are very complex and evolving!

Pathways of Airborne Pathogens



Aerobiological Engineering Handbook - Kowalski, Ch 31, figure 31.6

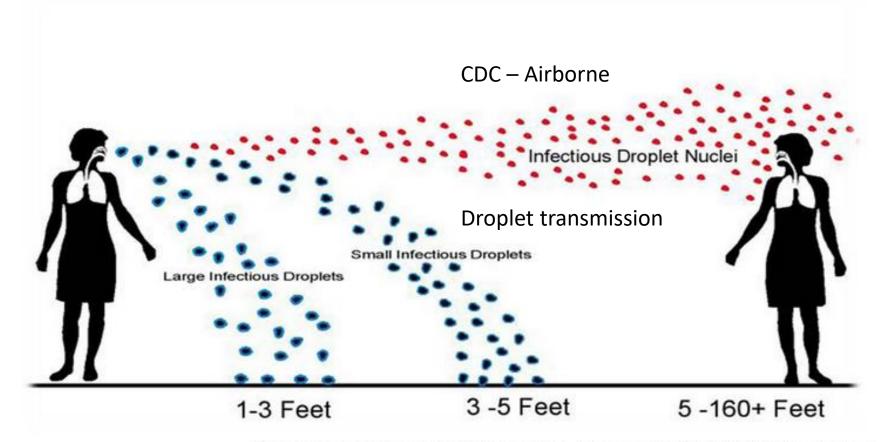


How far can Airborne Viruses Travel?

Larg	e/Small Droplets	Droplet Nuclei
1. Coughing	1-5 feet	160+ feet
2. Sneezing	8-15 feet	160+ feet
3. Singing, Talking	1-3 feet	160+ feet
4. Mouth Breathing	1-3 feet	160+ feet
5. Diarrhea*	5 feet+	160+ feet

^{*}As a Result of Toilet Water Aerosolization and Mechanical Fan Dispersion into outdoor air (2003 Hong Kong SARS Virus Epidemic)

AIR IMPURITIES CAN TRAVEL GREAT DISTANCES



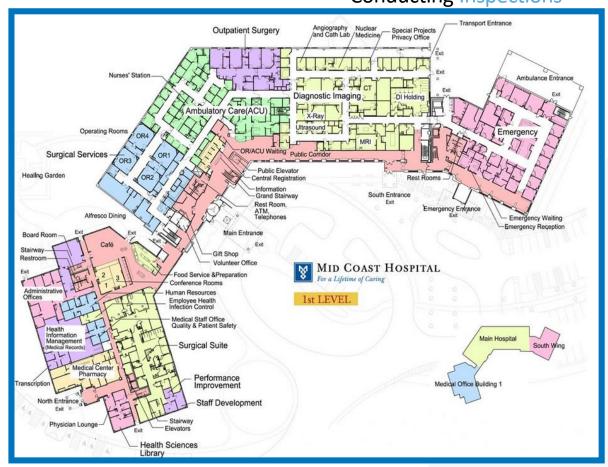
Virus Transmission in Indoor Air - Steven Welty CAFS, CIE, LEED AP

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 - ✓ Success Metrics documented
- Low Investment, High Return



Conducting Inspections





- Environment of Care Virtual Tour
- Room and Systems Inventory
- Risk Assessment



"Ill be happy to give you innovative thinking. What are the guidelines?"

Standards & Compliance













American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

American Society for Healthcare Engineering of the American Hospital Association

The *Guidelines* documents began as *General Standards* published in the *Federal Register* on February 14, 1947, as part of the implementing regulations for the Hill-Burton program. The FGI *Guidelines for Design and Construction of Hospitals and Outpatient Facilities* recommends minimum program, space, risk assessment, infection prevention, architectural detail, and surface and furnishing needs for clinical and support areas of hospitals, rehabilitation facilities, and ambulatory care facilities. The document also addresses minimum engineering design criteria for plumbing, electrical, and heating, ventilation, and air-conditioning (HVAC) systems, the latter by incorporating ANSI/ASHRAE/ASHE Standard 170: *Ventilation of Health Care Facilities*. The Joint Commission, many federal agencies, and authorities in 42 states use the *Guidelines* either as a code or a reference standard when reviewing, approving, and financing plans; surveying, licensing, certifying, or accrediting facilities; or developing their own codes.

Certification/Compliance... measureable, sustainable, authoritative...

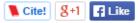
cer·ti·fy •) verb \'sər-tə-,fī\

- : to say officially that something is true, correct, or genuine
- : to say officially that something or someone has met certain standards or requirements
- : to say officially that someone is insane and in need of treatment

com·pli·ance | noun \kəm-'pli-ən(t)s\

: the act or process of doing what you have been asked or ordered to do: the act or process of complying

Full Definition of COMPLIANCE



- 1 a: the act or process of complying to a desire, demand, proposal, or regimen or to coercion
 - b: conformity in fulfilling official requirements

AN ENCYCLOPÆDIA BRITANNICA COMPANY



CEPro knows: Standards & Compliance













American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

of the American Hospital Association

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NEBB

www.nebb.org/ -

The National Environmental Balancing Bureau was created in 1971 to train at members at high quality in commissioning, ventilating, adjusting and balancing.

Must know codes & standards to test against and call out possible points of failure....CHECKLISTs built upon baseline criteria agreed to

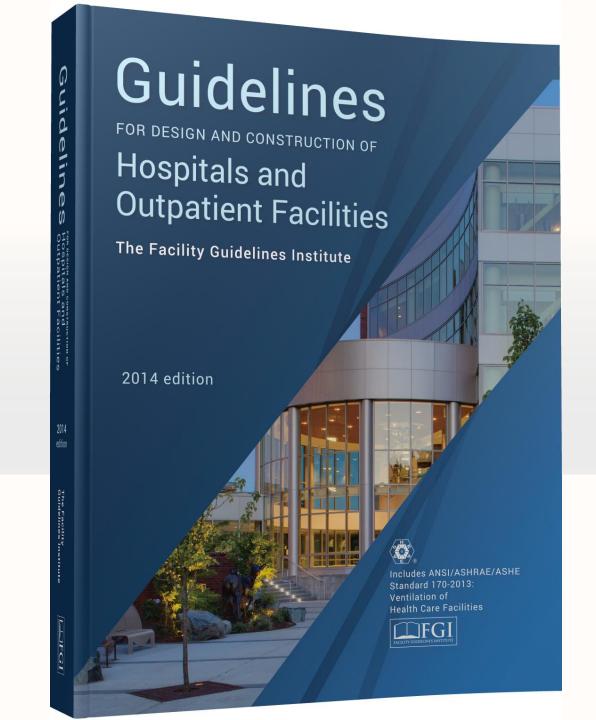


TABLE 7-1 Design Parameters

Pressure

All Room Air

Air Decirculated

TABLE 7-1 Design Parameters

Pressure

All Room Air

Air Recirculated

TABLE 7-1 Design Parameters

			TABLE 7-1	Design Pa	Design Parameters				
	Function of Space	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	RH (k), %	Design Temperature (I), °F/°C	
	Examination room	N/R	2	6	N/R	N/R	max 60	70-75/21-24	
	Medication room	Positive	2	4	N/R	N/R	max 60	70-75/21-24	
	Endoscopy	Positive	2	15	N/R	No	30-60	68-73/20-23	
	Endoscope cleaning	Negative	2	10	Yes	No	N/R	N/R	
	Treatment room	N/R	2	6	N/R.	N/R	max 60	70-75/21-24	
	Hydrotherapy	Negative	2	6	N/R.	N/R	N/R	72-80/22-27	
5	Physical therapy	Negative	2	6	N/R	N/R	Max 65	72-80/22-27	
•	STERILIZING								
	Sterilizer equipment room	Negative	N/R	10	Yes	No	N/R	N/R.	
CE	INTRAL MEDICAL AND SURGICAL SUPPLY								
	Soiled or decontamination room	Negative	2	6	Yes	No	N/R	72-78/22-26	
	Clean workroom	Positive	2	4	N/R	No	max 60	72-78/22-26	
	Sterile storage	Positive	2	4	N/R	N/R	max 60	72-78/22-26	
	SERVICE								
	Food preparation center (i)	N/R	2	10	N/R	No	N/R	72-78/22-26	
	Warewashing	Negative	N/R	10	Yes	No	N/R	N/R	
	Dietary storage	N/R	N/R	2	N/R	No	N/R	72-78/22-26	
	Laundry, general	Negative	2	10	Yes	No	N/R	N/R	
	Soiled linen sorting and storage	Negative	N/R	10	Yes	No	N/R	N/R	
	Clean linen storage	Positive	N/R	2	N/R	N/R	N/R	72-78/22-26	
	Linen and trash chute room	Negative	N/R	10	Yes	No	N/R	N/R.	
	Bedpan room	Negative	N/R	10	Yes	No	N/R	N/R	
	Bathroom	Negative	N/R	10	Yes	No	N/R	72-78/22-26	
	Janitor's closet	Negative	N/R	10	Yes	No	N/R	N/R.	
	SUPPORT SPACE								
	Soiled workroom or soiled holding	Negative	2	10	Yes	No	N/R	N/R	
	Clean workroom or clean holding	Positive	2	4	N/R	N/R	N/R	N/R.	
	Hazardous material storage	Negative	2	10	Yes	No	N/R	N/R	

Environment of Care – Space Inventory & Testing Criteria Alignment



			Base (ertificat	tion Serv	ices (1)	(1) Enhanced Certification Services (1)											
Function Space	Department/Group	Qty	Air Change <i>st</i> Hour	Pressure	Directional Airflow	Continuous Pressure Monitoring	Airflow Pattern (Short Cycling)	View/ Observation Vindow	Dedicated Exhaust	Non-Porous Ceiling	Door Closer	Hon- Operable Windows	Labeling	Control Strategy	Тевр	Hemidity	Door Closer	Floor Layout
OR	Surgical Critical Care	12	•	•	•	•	•			•	•			•	•	•	•	•
Labor & Delivery/C-Section	Surgical Critical Care	3	•	•	•	•	•			•	•			•	•	•	•	•
Sterile Storage	Surgical Critical Care	2	•	•	•	•	•			•	•			•			•	•
Contaminated Storage	Surgical Critical Care	3	•	•	•		•			•	•			•			•	•
Gl Endoscopy	Surgical Critical Care	1	•	•	•	•	•			•	•			•			•	•
Newborn ICU	Surgical Critical Care	2	•	•	•		•			•	•			•			•	•
Wound ICU (burn unit)	Surgical Critical Care	1	•	•	•		•			•	•			•			•	•
ICU	Surgical Critical Care	6	•	•	•		•			•	•			•			•	•
ER	Surgical Critical Care	4	•	•	•		•			•	•			•			•	•
ER decontamination (2)	Surgical Critical Care	1	•	•	•		•			•	•			•			•	•
Medical/Anesthesia Gas storage	Surgical Critical Care	2	•	•	•		•			•	•			•			•	•
Eye Surgery	Surgical Critical Care	2	•	•	•	•	•			•	•			•			•	•
Other	Surgical Critical Care	4	•	•	•	•	•			•	•			•			•	•
AliR	Inpatient Nursing	21	•	•	•	•	•	•	•	•	•	•	•	•			•	•
Immunosuppression	Inpatient Nursing	1	•	•	•	•	•			•	•			•			•	•
Protective Environment PE room	Inpatient Nursing	11	•	•	•	•	•			•	•			•			•	•
Other	Inpatient Nursing	2	•	•	•		•			•	•			•			•	•
Nuc Med	Radiology	2	•	•	•	•	•			•	•			•			•	•
Interventional Radiology	Radiology	1	•	•	•	•	•			•	•			•			•	•
OR X-Ray	Radiology		•	•	•	•	•			•	•			•			•	•
Cath Lab	Radiology	4	•	•	•	•	•			•	•			•			•	•
Other	Radiology	4	•	•	•	•	•			•	•			•			•	•
Labs	Diagnostic and Treatment	6		•	•		•			•	•	<u> </u>		•			•	•

Floor plans with highlighted critical rooms





	NORTHWESTERN MEMORIAL HOSPITAL								
BUILDING NAME FEINBERG/GALTER PAVILION									
	FLOOR	FIFTH FLOOR							
	LAST REVISED	07/11/2014							



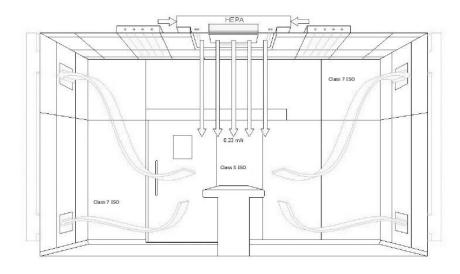
AREA COULD NOT BE ACCESSED DURING ATG SURY



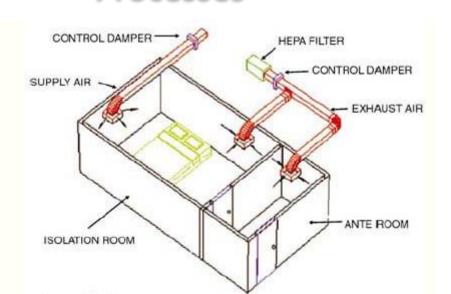


Identify Ventilation Systems Critical Failure points:

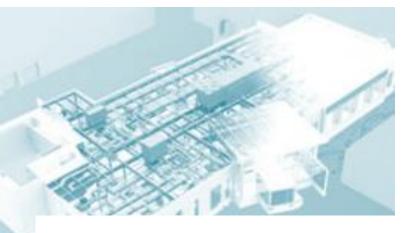




- Filtration
- Duct cleanliness
- Balancing dampers
- Duct lining
- Flow/Diffusers
- Controls/BAS
- Doors/Ceilings
- Processes



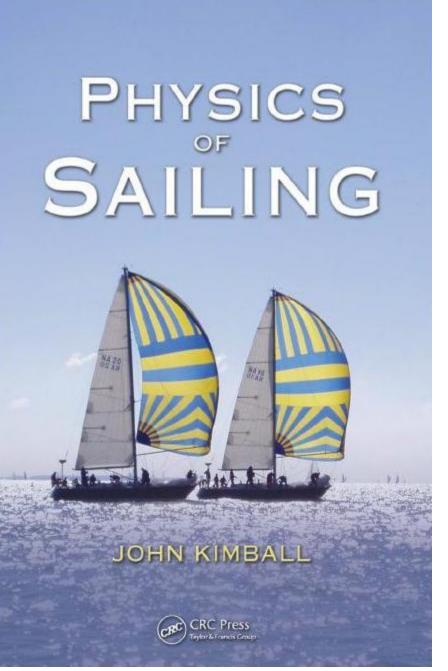
Identify Ventilation Systems Critical Failure points:

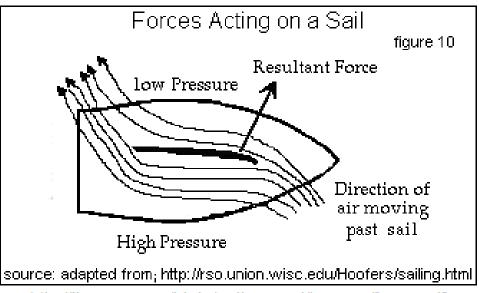


- Filtration
- P Duct cleanliness
- Balancing dampers
- Duct lining

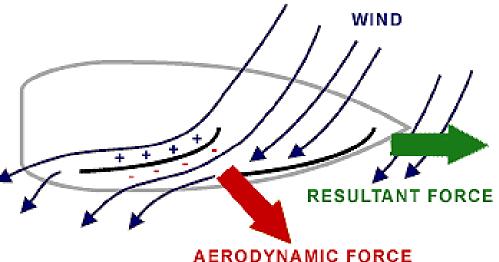
Literally close to a HUNDRED failure points, in your systems & spaces, that could lead to increased risk of infection!...without knowing about the failures....







http://theamya.org/hints/sailmanual/images/forces.gif





Harnessing the Wind to Sail

_

Physics & Power of Air in the Physical Environment

- Wind power energy = fan energy/ systems pumping air
- Transporting conditioned air = tempered (heated/cooled/moisture...)
 space clean/impurity free, ventilation (oxygen....fuel for a productive body to function/work
- Laminar vs. Turbulent
- Too much.....excessive drying times....Too little
- Forces/Pressures.....
- Calm-Gusts/Earth surface breathing in/out......Building expanding/contracting/pressure relationship to OA.

....and if any of these things go SOUTH it can be catastrophic to IP/C leading to increased Infection Transmission....

UTILIZING CLEANROOM TECHNOLOGY TO IMPROVE CONTAMINATION CONTROL IN OPERATING ROOMS

Jennifer A. Wagner, Ph.D.
Principal Infection Control
Consultant
Prism Environmental Health &
Safety Solutions, Inc.
MEMB: APIC, ACFEI, AIHA

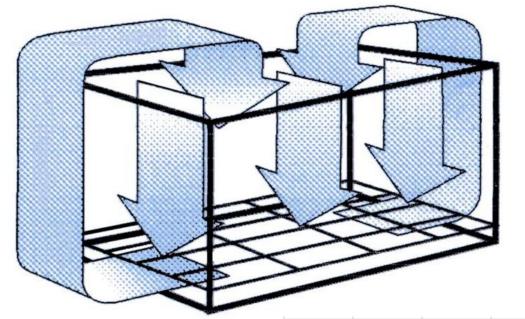
Kevin J. Schreiber,
Director of Healthcare
Huntair, Inc.
MEMB: ASHRAE, ASHE, AIA, ISPE

Ralph Cohen, P.E.
Principal
Ralph M Cohen Consultancy
MEMB: ASHRAE

INTRODUCTION:

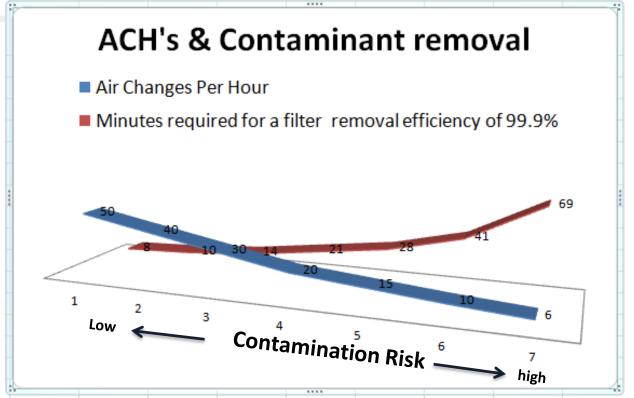
Annually, the United States is affected by 1.7 million Healthcare Associated Infections (HAIs). The CDC reports nearly 99,000 deaths per year resulting from these HAIs. Furthermore, over 8,000 people die each year due to infections acquired during surgical procedures. This number is likely an underestimate due to the difficulty in gaining complete, accurate postoperative infection information. In addition to quality of care implications, the added healthcare costs of treating surgical site infections (SSIs) are no longer reimbursed for Medicare patients, placing the financial burden squarely on the shoulders of hospitals. On average, the cost to hospitals per SSI is \$25,546. In aggregate, this amounts to \$7.4 billion in additional healthcare costs every year. 2,3

Landmark studies performed by Lidwell and his colleagues^{4, 5} along with many other studies^{6, 7} have indicated a strong connection between contamination in the air during surgeries and SSI rates. Clinical trials carried out in Britain, Europe, and the United States have confirmed that between 80 and 90% of bacterial contaminants found in the wound after surgery come from colony forming units (cfu) present in the air of the operating theatre. With respect to bacteria transmitted to the surgical site through the air, squames (or skin scales) are the primary source of transmission. Approximately 1.15 × 10⁶ to 0.9 to 10⁸ squames are generated in a typical two to four hour surgical procedure. Bacteria present in these skin scales are one cause of SSIs.



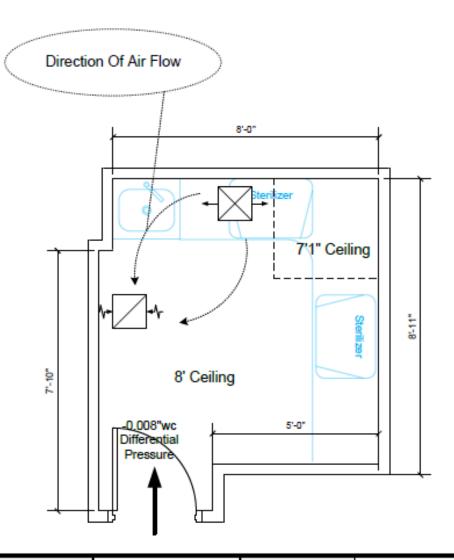
How many is enough?

Why just pressure?



Pressure & Air Flow Directions

....example of supply air short cycled to exhaust not providing a complete washing of the room



				JACHO /		JACHO /	
	Supply	Exhaust	ACH	IDPH	ΔΡ	IDPH	Overall Room
Room	Volume	Volume	@ <u>>10</u>	Compliant	(@Pos <u>></u> .010)	Compliant	Condition
GI Decon	125	127	14.1	Pass	-0.008	Pass or Fail?	Pass or Fail?

Building Automation data collection.....CALIBRATION during data gathering!







SIEMENS









Operating Room/Surgical Suite Solutions

CEPro, Inc. Critical Environments Professionals

OPERATING ROOMS / SURGICAL SUITES

A facility's infection control systems must ensure the safety of patients, staff and visitors. Space control systems must be designed to continually monitor and clearly display current conditions and alarms. Critical Room Control provides complete turnkey systems that define best practices and include intuitive user interfaces that clearly indicate current status while automating proper space use.

Surgical Suite solutions from Critical Room Control offer compl

- · Fast, accurate, and reliable room pressure, temperature, an
- Reduced liability with fully automated room changeover.
- Closed loop control with true variable feedback
- Industry's lowest air valve pressure drop
- · Energy efficient control sequences
- · Clear intuitive LCD touch screens

CLOSED LOOP VALVES:

CRC-CIV

in order to ensure that safe operating conditions are being met, it is critical to measure the output that is being controlled. Our unique closed loop venturi valve provides long term reliability, unmatched accuracy, and true airflow measurement.

- · Clased loop control
- · True oir flow measurement
- · Industry lowest energy requirements
- · Impervious to lint, dirt and dust
- Low pressure drop
- · Confirmation of desired set point
- · Fast acting and foilsafe
- · No scheduled maintenance
- Accurate to ±5% of flow
- · No minimum static pressure requirements
- · No required straight duct runs
- · 10 to 1 turndown
- · Aluminum, steel, stainless, and coated valve construction
- · Mount in any prientation

MultiVIEW Monitor:

The MultiVIEW is an advanced 7" LCD touchscreen display that is designed to be configured for any monitoring or sequencing application. It's core function is to give local access to critical information in an easy to read display. It supports up to six (6) fully configurable graphical icons - allowing the facility user to joint values, modes, status, set points, and alarms.

- " LCD touch screen volues, set points, room
- Analog and digital input and outguts for point values, modes or status indicator
- udible and visual alarms
- Network for values, modes or status points Set point, status and mode networked or
 - hardwired



re-or

points total) via on board network connectivity

- Bright / sunlight readable 4" or 5.7" LCD touch screen
- Designed to integrate seamlessly with the CRC-RPM/C or BAS
- Device can be configured to manitor up to 4 rooms
- Display and planm up to 5 user selectable data elements (points) for each of the four (4) rooms
- Resistive touch control Use bare finger, gloved finger, or stylus to interact with LCD screen
- Clear / unambiguous display of rooms overall status and points
- Local alarm acknowledge (sillence)
- In addition to the five (5) data elements (points), each room has an independent overall status with audible and visual alarm



The bright, colorful, easy to read LCD touch screen can monitor and control the pressure relationship of up to two rooms while giving clear indication of the room's current status, precaution information, and current pressure readings.

Some of the features that make CRC's Room Pressure Controller the industry leader include:

- · Monitor / control up to two rooms with one controller
- Best in class industrial grade dead ended direct pressure measurement
- 5 fully customizable modes
- Automated room changeover
- Shows precoution information (Airborne, Droplet, Contact, Standard, None)
- Displays current value, alarm, and set point adjustment of up to 8 points
- Automated room decrine timer · VO and Network diagnostic functions
- Onboard BACnet MS/TP Communications
- · Dual password protection

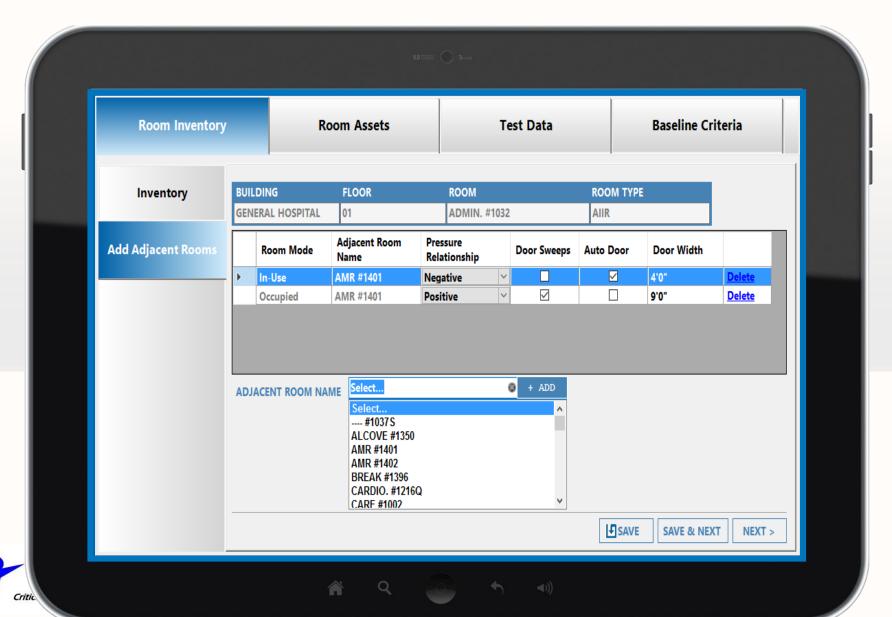




Developing a Comprehensive "Environmental Compliance Infection & Quality Control" Strategy

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- IP/C Risk Assessment & Inventory
 - ✓ Team Assignment
 - ✓ Identification of Critical Function Space & Systems
 - ✓ EOC Virtual Tour
- Compliance <u>Testing</u>
 - ✓ Testing Scope & Baseline Agreement PASS/FAIL criteria!!!
 - ✓ Scheduling
 - ✓ Quality Management Toolset
- Correction of Deficiencies
 - ✓ Expedite, Develop & Implement Plan for Improvement
 - Codes, Standards, Guidelines Referenced
 - ✓ Re-Balancing
 - ✓ <u>Calibration</u> of Automation/Temperature & Vent Controls
 - ✓ Design/Budget/Build
 - √ New Construction/Renovation ICRA Process Support
 - ✓ Energy Efficiency Focused
 - ✓ Continuous Commissioning
- Closing the Loops
 - ✓ Documentation Hard Copy and/or On-Line/Cloud based Technology Database
 - ✓ Process Review
 - ✓ Success Metrics documented
- Low Investment, High Return

Environmental Compliance Infection & Quality Control DATA TOOLSET REPEATABLE QUALITY CONTROL PLATFORM



FIELD TESTING & DATA GATHERING, COMPLIANCE INVENTORY & DOCUMENTATION TOOLSET – REPEATABLE QUALITY CONTROL

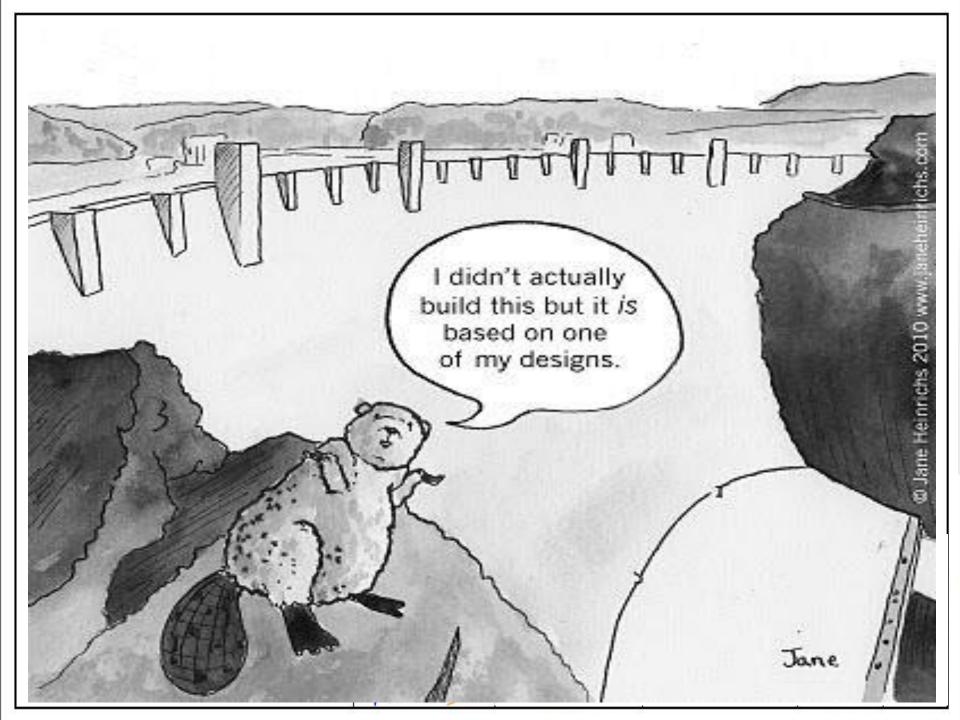
Functional Performance Procedures checklist transition seamlessly into Data Toolset

- Creates Critical Space & Systems Inventory
- Spaces systematized
- Floor plan location with Space adjacency
 - Asset records archived
 - Point of Failure identification checklist
 - Establishes testing frequency & procedures
 - Baseline compliance criteria established
 - Report templates created or customizable
 - Compliance Dashboard Summary
 - BAS & Controls sensing input & algorithm output Calibration
 - Locked in Quality Control
 - Cost efficiencies experienced once built



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 - ✓ Success Metrics documented
- Low Investment, High Return



Assessment/Design/Budget/Build/Certify Benefits:

- <u>Collaborative</u> process:
 - ✓ assessment of current conditions & compliance design needs
 - ✓ transparent implementation & certification
- Cost containment and control
 - ✓ agreed upon scope of work with all parties and respective GMP (Guaranteed Max. Price)
- Project <u>risk</u> carried by the design/build service provider and not the client
- <u>Turnkey Team</u> made up of client project & ops reps, proven & known design & contracting firms, communications efficiencies gained with one point of contact through out process
- <u>Compliance guarantee</u> and validated thru testing procedures providing recognized accreditation documentation

Design/Remediate/Commission/Communicate

CEPro, Inc. 103 N. Donald Arlington Heights, Il. 60004 (847) 636-77 10/Fax: (847)655-6087					Hospital - Function Space Inventory		
Function of Space	Pressure Relationship (Pass / Fail)	Minimum ACH	Date Tested/Verified	Overall Pass / Fail	Comments	Best Practice To Be Performed	Notes
runction of Space	(Fass / Fall)	(Fass / Fall)	rested/ verified		urgical Critical Care	best Fractice to be Ferformed	Notes
0-44		B	M 42		-	Lestell Continuous Barrers Manitarian	0
Or #1	Pass	Pass	May-13	Pass	Rebalanced as part of Original Remediation	Install Continuous Pressure Monitoring	Completed
Or #2	Pass	Pass	May-13	Pass	Rebalanced as part of Original Remediation	Install Continuous Pressure Monitoring	
Or #3	Pass	Pass	May-13	Pass	Rebalanced as part of Original Remediation	Install Continuous Pressure Monitoring	
Or #4	Pass	Pass	May-13	Pass	Rebalanced as part of Original Remediation	Install Continuous Pressure Monitoring	
Or #5	Pass	Pass	May-13	Pass	Rebalanced as part of Original Remediation	Install Continuous Pressure Monitoring	
Nuc Med #1	Pass	Pass	Aug-13	Pass	Install Door Sweeps, Ceiling, Monitor & Short	Install Door Sweeps, Ceiling, Monitor & Short Cycle	
Nuc Med #2	Pass	Pass	Aug-13	Pass		Install Door Sweeps, Ceiling, Monitor & Short Cycle	
Nuc Med #3	Pass	Pass	Aug-13	Pass	Install Door Sweeps, Ceiling, Monitor & Short	Install Door Sweeps, Ceiling, Monitor & Short Cycle	
					Install Door Sweeps, Ceiling, Monitor, switch-		
Nuc Med #4	Pass	Pass	Aug-13	Pass	to Positive pressure	Door sweeps, Pressure monitor and ceiling	
					Add 700+ SUP CFM, Door sweeps & Pressure	Add 700+ SA CFM via new RTU, Door sweeps &	
Nuc Med #6	Fail	Fail	Aug-13	Fail	monitor	Pressure monitor	
				Dia	gnostic and Treatment		
Endo #2	Fail	Fail	Aug-13	Fail	Increase Supply CFM for ACH & Diff Pressure	Re-Proportion Supply?, Install Sweep,	
Endo #3	Fail	Fail	Aug-13	Fail	Increase Supply CFM for ACH & Diff Pressure	Re-Proportion Supply?, Install Sweep,	
Endo #4	Fail	Fail	Aug-13	Fail	Increase Supply CFM for ACH & Diff Pressure	Re-Proportion Supply?, Install Sweep,	
Endo #7	Fail	Fail	Aug-13	Fail	Increase Supply CFM for ACH & Diff Pressure	Re-Proportion Supply?, Install Sweep,	
Endo Clean Workroom	Fail	Fail	Aug-13	Fail	Increase Supply CFM for ACH & Diff Pressure	Re-Proportion Supply?, Install Sweep,	
Endoscope Cleaning	Fail	Fail	Aug-13	Fail	Increase EXH CFM for ACH & Diff Pressure	Increase EXH, Install Sweep, Install Iso-Damper	
·			J		Laboratory	·	•
Chemistry	Pass	Pass	Aug-13	Pass	Install Door Sweep, Ceiling	Requires New Ceiling and Air Pattern Repair	
Cytology	Pass	Pass	Aug-13	Pass	Install Door Sweep, Ceiling	Requires New Ceiling and Air Pattern Repair	
Histology	Pass	Pass	Aug-13	Pass	Install Door Sweep, Ceiling	Requires New Ceiling and Air Pattern Repair	
					Re Balance for Negative Pressure and ACH,		
Histology Storage	Pass	Pass	Aug-13	Pass	Door Sweep & Ceiling	Door Sweep	
01					Re Balance for Negative Pressure and ACH,		
Hematology/Blood Bank	Pass	Pass	Aug-13	Pass	Door Sweep & Ceiling	Requires New Ceiling and Air Pattern Repair	
◆ → → Sheet1			7.00 20		4	III	
JIICCLI G							



Deficiency/PFI Action Plan

			Ventilation Compli	ance Re	emedia	ntion Log
Room Number	Deficiency Date Tested	Deficency Description	Suggested Remediation/Course of Action	Corrected By	Date Re-Tested	Remarks
OR #2 (3153)	10/13/2015	Room Pressurization is low, and the monitor is out of calibration.	Suggest increasing supply and calibrate the monitor.	Facilities/CEPro		Was retested on 10/14/2015 and was not enough increase for compliance. Calibrated the monitor. Space remodeling project Dec. '15 thru Dec.'16
OR #3 (3103)	10/13/2015	The monitor does not register pressure.	Calibrate the monitor.	CEPro	10/14/2015	Calibrated.
AllR #15 (3155A)	10/13/2015	The monitor is out of calibration.	Calibrate the monitor.	CEPro		10/14/2015 we could not calibrate the monitor. Suggest an indepth remediation, rewire and calibration of this monitor. Monitor being replace by IBS Milton Woo
AliR ER#9 (T1130)	10/21/2015	The monitor is out of calibration.	Calibrate the monitor.	CEPro	10/21/2015	Calibrated. Monitor being replace by IBS Milton Woo
Cysto (3143)	10/26/2015	Not enough ACH's, there is no return.	Increase both the supply and return volumes.	Facilities		10/27/2015 we rechecked and found a small increase in supply, and an increase in return volume. We are now still low on ACH's and the room's pressurization needs to be increased. Supply air increased - 1535?
OR #7 (3117)	10/26/2015	The monitor is out of calibration.	Calibrate the monitor.	CEPro	10/26/2015	Calibrated. Space remodeling project Dec. '15 thru Dec.'16
OR #8 (3119)	10/27/2015	The room pressurization is low, the returns are low, and the monitor is out of calibration.	Increase the room's supply air and calibrate the monitor.	Facilities/CEPro		10/27/2015 the monitor was calibrated. Space remodeling project Dec. '15 thru Dec.'16
Clean Core (39097)	10/27/2015	The room's ACH's are low, and the retuen volume is low.	Increase both the supply to over 1320 cfm, and return volume differential should increase.	Facilities		Supply are increased?
All CAC OR's- 22-26	10/27/2015	All OR's have excessive ACH's and room pressurization.	Reduce the rooms cfm's.	Facilities		Discuss with Facilities about remediation for these rooms, they do pass. The high ACH's are based or
#18 (39016) CAC	10/29/2015	The room pressurization is low, the returns are low.	Reduce the supply ofm.	Facilities		High leakage room - ceilings, electric, plumbing common to the majority of CAC
Minor Procedures (5853A)	10/30/2015	Room pressurization is low, high ACH's.	Reduce both the supply and returns to required ACH's and Pressures.	Facilities		Reducing the exhaust will help with room Pressurization, ACH's are much higher than needed. Facilities to reduce exhaust 200 cfm
Eye Surgery #1 (5851)	10/30/2015	Room pressurization is low, high ACH's.	Reduce both the supply and returns to required ACH's and Pressures.	Facilities		Reducing the exhaust will help with room Pressurization, AHC's are much higher than needed. Facilities to reduce exhaust 200 cfm. High ACH's by design
Eye Surgery #2 (5849)	10/30/2015		Reduce both the supply and returns to required ACH's and Pressures.	Facilities		Reducing the exhaust will help with room Pressurization, ACH's are much higher than needed. Facilities to reduce exhaust 200 cfm. High ACH's by design
Patient Rm #8 (3210)	10/28/2015	Room pressurization is in the wrong direction. Dave Haaz?		Facilities		SICU area
Sterile	10/28/2015	Room pressurization is in the wrong direction.		Facilities/CEPro	00	Need to check ventilation in adjoining area and other exhaust / Increase MUA

Healthcare successes....





Resurrection Medical Center



Ventilation Compliance: A New Approach to Infection Control

"How else can we leverage this technology?" and that led us to the CEPro \$2M remediation plan for improvement design/build compliance solution with energy efficiency for over 40 rooms with approximately 30,000 square feet, including clean sterile storage, cath labs, nuclear medicine, and ORs...."

Joseph Bettuzzi d Plant Operations

Director of Facilities and Plant Operations
Presence Health, Chicago

USP 797-800 Cleanroom Solutions



USP 797-800 Cleanroom Solutions

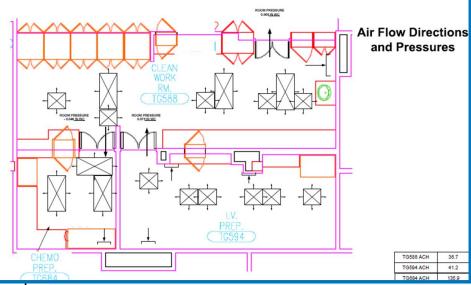






Customer				oject Name: ect Number: Date:					_	
Attn					Sheet:	1	of	:	1	-
	Pharm	acy Drug	Preparat	ion Area (Complianc	e Inspect	tion Sheet			Ī
	Room		Primary	Engineerin	g Control	Min	Class Requir	emei	nt]
Ante-Room	n Exist?	~			ISO Class 7]
Non-HD Pro	ep Room Ex	ist? ☑	V L/	AFW □ CA	ΔI		ISO Class 7			1
HD Prep Ro	om Exist?	~	✓ BS	sc 🗆 c	ACI		ISO Class 7]
		Complian	ce Criteria							Ī
Ante-Room	١		.02" WC	MIN AC	CH = 30	Daam	Not Co.			İ
			.02" WC	MIN AC	CH = 30	Koom	Not Co	mpi	iant	
HD Prep Ro	om	ΔP < -0.	01" WC	MIN AC	CH = 30					
Ante-	Room	Non-HD P	rep Room	HD Pre	Room					
Vol	856	612	608	Vol	783	Pressu	ure Differei	ntial	s ∆P	ĺ
ACH	38.9	ACH	34.5	ACH	93.9					_]
						Ante-Roo	om to Room	0	.000	1
Supply	Ret/Exh	Supply	Ret/Exh	Supply	Exhaust					_
555	460	350	240	1110	1225	-	rep Room to			
	Cummber	Poturo / F	whaust Tate	le Balanı			-Room		11	^^
555	460	& Return / E 350	240	1110	1225	HD Prep Room to Ante- Room				V
					or Informati		OOIII		- 1	
	Room Name	2		acturer	Actual	Display	Comr	ment		V
Ante	-Room to R	oom	Critical Ro	om Control	0.000	0.0001	Comp	pliant		
Non-HD Pre	ep Room to	Ante-Room	Critical Ro	om Control	-0.003	-0.003	Comp	pliant		
HD Prep	Room to An	te-Room	Critical Ro	om Control	-0.009	-0.009	Comp	pliant		
				n Inspection						
- · · ·			Ante	-Room Requ				_	┈╟	
	ous Monitor Demarcation					ree Hand-W el Returns E	ash Sink Exists			
		of Line of D	emarcation				rty Side of Line		Ę	
E SIIIK OII	Cicuii Siac	Of Line Of D			Requirement		rty side of Line	-	II.	
☑ Continu	ous Monitor	r Installed	HOII IID	rep nooni			board In Roon	n		
		Controls Ce	rtification C	urrent		el Returns E				
			HD Pre	p Room Re	quirements					
☑ Continu	ous Monitor	Installed			☐ Low Lev	el Exhaust E	xists			
		Controls Ce			☑ PEC Exha	usted to O	utside			C
☑ Room for Storage of HD's (Including Refrigerated)										-
				neral Requir	_					Ţ
		hes are Scub					aled to Above			1
✓ Floor is	Wide Sheet	Vinyl with Fl	ashed Cove	Base	Proper G	owning Pro	cedures Follov	ved by	/ Staff	J

Compliance Deficiency/PFI Action Plan Certification



CEPro, Inc. Form C- PPIS (5/16)

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103 N. Anlingto (847) 536

CEPro, Inc.	
I3N Donald	
ing ton Heights. IL 60004	
636-771 @Fxx: 847 655-6 <i>0</i> 87	



į į	/Mington (847) 636-7
Customer	Customer: Medline
	1710 S.
	Wauke
Attn	Attn: Brian R
Termin	SYST
Numbe	Equipment Location
RTU-1	Area Served
1	Equipment Manufa
2	Model
3	Serial Number
4	
5	Total CFM - Fan
Return	Total CFM - Outlet
1	Total Static Pressu
2	Inlet Pressure
	Discharge Pressure Fan Rpm
RTU-2	
RTU-2	Motor Manufacture
1	Motor Manufacture Motor HP/BHP
2	Motor Manufacture Motor HP/BHP Phase / Hz
1 2 3	Motor Manufacture Motor HP/BHP Phase / Hz Voltage
1 2 3 4	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage
1 2 3 4 5	Motor Manufacture Motor HP/BHP Phase / Hz Voltage
1 2 3 4	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact
1 2 3 4 5	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I
1 2 3 4 5 Return	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact Starter Heater Ele
1 2 3 4 5 Return 1	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact
1 2 3 4 5 Return 1	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact Starter Heater Ele Motor Sheave & Bu
1 2 3 4 5 Return 1	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact Starter Heater Ele Motor Sheave & Bush
1 2 3 4 5 Return 1	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact Starter Heater Ele Motor Sheave & Bush Belts
1 2 3 4 5 Return 1	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact Starter Heater Ele Motor Sheave & Bush Belts Pulley Adjustment Center Line/Motor
1 2 3 4 5 Return 1 2	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact Starter Heater Ele Motor Sheave & Bu Fan Sheave & Bust Belts Pulley Adjustment Center Line/Motor Comments: PCMC F
1 2 3 4 5 Return 1 2	Motor Manufacture Motor HP/BHP Phase / Hz Voltage Amperage Motor RPM Power/Efficiency I Motor Service Fact Starter Heater Ele Motor Sheave & Bush Belts Pulley Adjustment Center Line/Motor

	,,,,,,	,,-								
	Customer:	ABC Medical Ce	nter		Project:	All Room 209-1	1			
					Number:	IC.120213.02				
		Chicago, Illinois			Date:	3/1/2012				
	Attn:				Sheet:	6	of	9		
+										
				SPM Inspec	tion Shee	ŧ				
		Tag Info	mation		AliR 211					
	Configuration	n:	SPM 2100		SPM Pressure	e:	-0.0148"W	C.		
	N2 Commun	loation:	Yes		BAS Alarm:		Yes			
	Design Negat	tive Pressure:	-0.01"WC.		Actual Nega	tive Pressure:	-0.0148"W	C.		
	Design Positi	ve Pressure:	N/A		Actual Post	tve Pressure:	N/A			
				Config	uration					
	Polarity:	Nega	tive	Positive		■ Neutral	☐ Of	f		
	11	- 1				E 61 141				

1	ag Infon	mation		AIR 211						
Configuration:	_	SPM 2100		SPM Pressu	ire:	-0.0148"WC.				
N2 Communication:		Yes		BAS Alarm:		Yes				
Design Negative Pre-	ssure:	-0.01"WC.	-0.01"WC.		ative Pressure:	-0.0148"WC.				
Design Positive Pres	sure:	N/A		Actual Pos	ttive Pressure:	N/A				
			Config	uration						
Polarity:	Negation	tive	Positive		■ Neutral	□ Off				
Units:	In H2				ft. Min					
Full Scale:	±.1 /	1000	<u>+.01</u> / 5	00	±.005 / 250	■ ±.001 / 100				
Altitude:	⊠ 0		1000		2500	5000				
Remote Option:	☑ Polar	rity			☐ Mute					
Alarms										
Alarm Set Point:	Hi Set po	oint -0.0	9" wa		Lo Set Point	004" wa				
Alarm Tone Active:	Yes		_							
Latched Alarm:	No									
Alarm Delay:	■ 10 S	econds	30 Second	s [60 Seconds	■ 120 Seconds				
			Ot	her						
Address:	232									
Remote Standby:	Uper									
Display Override:	Ur									
Calibration Override	: Ur 9	92%								
			Rev	tsion						
Transmitter:	E15									
Tool:	B11									
				Descriptions						
SPM is wired correctly			connected to	the SPM usi	ng the factory su	pplied cable				
Set point indicates p	roper oor	nfiguration								
Status light remains	solid gr	een indicatin	ng proper oper	ration						
Alarm sounds when p				alarm delay	time					
Alarm "Mute" button										
LCD (If applicable) is										
Switch (If installed) i				red modes ((Pos, Neg, N, Stb)	()				
N2 Communication is										
Remote Monitor "Alar	m funct	tions properly	У							

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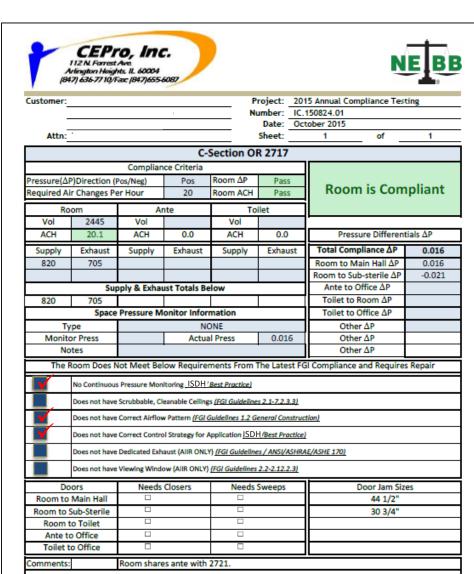
Environment of Care Compliance Testing Summary checklists/reports





Customer:	ABC Medical Center	Project:	2013 Annual Iso Rm Certification					
	801 S. Milwaukee Ave.		IC.131021.01 Room 36 Decon					
	Pikeyville, IL 60048-3199	Date:	11/11/13					
Attn:	Bob Gopherman	Sheet:	5	of	7			

		(AIIR) DECON Room Inspection Sheet													
Description Comply Initial/Date N															
	Decon Rm exhaust & supply air rate is sufficient to maintain 2.5Pa (0.01"wc.)	Yes	CJB 11/11/13												
2 [Direction of airflow supports room condition (No Short Cycling)	Yes	CJB 11/11/13												
	Patient room has dedicated exhaust other than toilet exhaust	Yes	CJB 11/11/13												
	Room / Space does not have "Operable" windows	Yes	CJB 11/11/13												
	Room has both audible and visual alarm	Yes	CJB 11/11/13												
	Door seals are free of deterioration and form tight seal	Yes	CJB 11/11/13												
7 [Door sweeps adjusted so room maintains pressure & door closes properly	Yes	CJB 11/11/13												
	Automatic door closers are installed and door closes safely and tightly	Yes	CJB 11/11/13												
	Ceiling (wallboard or tiled) is installed correctly without cracks or gaps	Yes	CJB 11/11/13	\boxtimes											
10 F	Pressurization sensors/probes are clear of blockage, debris, lint, and dirt	No	CJB 11/11/13	\boxtimes											
	Supply & Exhaust diffusers are clear of blockage, debris, lint, and dirt	Yes	CJB 11/11/13												
	Room is labeled according to specifications (Neg., Pos., or Neutral.)	Yes	CJB 11/11/13												
13 F	Room was measured to determine APH (≥12 renovated / ≥6 existing (1993))	Yes	CJB 11/11/13												
	Drawings / prints are available for Isolation room or space	Yes	CJB 11/11/13												
15 F	Pressure monitor is functioning properly and is ready for operation	No	CJB 11/11/13	×											
16	Ante Room exists and is configured properly	Yes	CJB 11/11/13												
17 F	Door/Wall between anteroom and isolation room has a "view" window	Yes	CJB 11/11/13												
18 1	No live plants or other potential airborne storage vessels exist in AIIR space	Yes	CJB 11/11/13												
	MEP functions of space appear normal: no leaks, outages, etc	Yes	CJB 11/11/13												
20	Located Ideally 30ft from ambulance entrance	Yes	CJB 11/11/13												
21	nternal Entrance to corridor	Yes	CJB 11/11/13												
22	Boundaries of yellow paint and "Decon" 3' from door / 6' from wall	No	CJB 11/11/13	図											
23	At least two hand-held shower heads, temperature-controlled; curtains or	NI-	C ID 44 (44 (42	_											
	other devices to allow patient privacy, to the extent possible	No	CJB 11/11/13	M											
24 (Contains a work counter, hand-washing station with hands-free controls and	No	CJB 11/11/13	-											
l la	an area for personnel gowning	INO	CJB 11/11/13	×											
	Water runoff is contained separately (treated as effluent)	Yes	CJB 11/11/13												
26	There should be a "saddle" at the floor of the door buck to prevent efflux	No	CJB 11/11/13	×											
27	Ceiling, wall, and floor finishes shall be smooth, nonporous, scrubbable, non-														
l a	adsorptive, non-perforated, capable of withstanding cleaning with and	No	CJB 11/11/13	×											
- 6	exposure to harsh chemicals			_											
	Floors shall be self-coving to a height of 6 inches (15.24 centimeters). The														
	surface of the floor shall be self-finished and require no protective coating	Yes	CJB 11/11/13												
	for maintenance														
	Two hospital telephones; two duplex electrical outlets, secured	No	CJB 11/11/13	M											
	appropriately for a wet environment	.40	200 11711710												
	The decontamination area may function as an isolation room or a patient	No	CJB 11/11/13	M											
Ш	nygiene room under routine departmental function	140	225 117 117 13												



Environment of Care

			Cor	npl	liar	ıce	da	ata	& 0	des	sig	n r	ec	or	nr	n	en	d	ati	OI	าร		
IC.130114.01			All	IR Certif	ications	Master	Summ	ary	Sumn	nary for A	AllR Comp	liance	AliR, Cla	ass Δ-(OR's	/I DR	PF nr	rotecti	ve envi	r filt	eration		Critical E
Roc	om Differe	ntiation			Room Te	ested For:			Janna	1017		Pass / Fa	ail Criteri	ia		,, <u>LDI</u> ,		oteeti	Repair	,			
										1	2	;	3		4		5	6	7	8	9	10	11
			1/-	OA cfm						Continu		Different	Worst Recorde	Patien	Ante	Bath		View		Non Porou			
			distribution	Air	Airflow	Constant				Monitor	Monitor	ial	d	t ACH	ACH	ACH	Short	Windo	Dedicat	s	Door	Labeli	BAS F

Tek-Air SPM

TSI-Pressura

Tek-Air SPN

None

Cycling)

m Num

6 420

8 504

12 | 2-109

13 2-122

15 | 3-108

16 3-123

17 4-108

18 4-123

19 | 5-108

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21 Endo

22 SDS#12

23 Morque

Nursing

Nursing

Nursing

Nursing

Nursing

Nursing

Surgical

Critical Care

Treatment

AllB

IC.130114.01			AII	R Certif	ications	Master	Summa	ry														Critical Environmen	ės Professionuli	
									Summ	nary for A	AIIR Comp	liance	AIIR, Cla	ass A-C	OR's/L	DR, P	E prote	ctive en	vir., filt	eratio	n			
Room	Differentiati	ion			Room Te	sted For:					(Prassur	Pass / Fa			1			Repa	r Progra	ım Requ	uired			
										- 1	2		:		4		5 6	7	8	9	10	11		
			+/-	OA cfm Volume						Continu ous		Different					Vic		Non Porou				Overal	
				Air	Airflow	Constant				Monitor	Monitor	ial	d	t ACH	ACH A	CH S	hort Wis	do Dedica	t s	Door	Labeli	BAS Room		

IC.130114.01		All	R Certif	ications	Master	Summa	ry															Critical Environment	3 Protessionals	
								Sumn	nary for A	AIIR Comp	liance	AIIR, Cla	ass A-C	C OR's,	/LDR,	PE pr	otecti	ve envi	r., filte	eration	١			
Room	Differentiation			Room Te	sted For:						Pass / Fa			ı s)				Repair	Progra	m Requ	ired			
									1	2	3	:		4		5	6	7	8	9	10	11		
		.,	OA cfm						Continu		Different	Worst Pecorde	Paties	Anta	Batk		View		Mon Porou				Overal	
		+/-	Volume	Airflow	Constant				Monitor		lei	d						Dedicat		Door	Labeli	BAS Room	1	

Pass

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2.1301	114.01			All	K Gertii	ICALIONS	iviastei	Summa	пу																	
							Sumn	nary for A	AIIR Comp	liance	AIIR, Cla	ass A-C	OR's	/LDR,	PE pr	otecti	ve envi	r., filte	eration							
	Poom	Differenti	istian			Poom To	sted For:					(P	Pass / Fa							Repair I	Drogra	m Post	irod			
_	KOOII	Dillerent	lation			NOOIII TE	steu For:		-			(1722741	ar and Hon		Casaltia	-,				nepair i	Progra	m nequ	ireu			
											1	2	3			4		5	6	7	8	9	10	11		
					OA cfm						Continu			Worst							Non					
				+/-	Volume						ows		Different						View		Porou				Overal	
				distribution	Air	Airflow	Constant					Monitor	ial							Dedicat				BAS Room	'	
					Exchange	Pattern	Pressure		Temperatu		ing	Performan	Pressure							ed EXH		Closer	∎g			Comple
lte	Room	Room		Differentia	Rate	(Short	Monitorin	Door	re &	Monitor	Pass/Fai	ce	[20.01"	zeM)	Pass/F	Passi	Passi	Passi	Passi	Pass/Fai	g	Pass/F	Passi	Strategy	Pass/	te

Pass

-0.0160

-0.0170

-0.0140

-0.0340

-0.0240

-0.0290

-0.0390

-0.0300

-0.0410

-0.0170

14.77

13.36

21.99

23.24

21.60

17.44

18.14

16.43

14.63

15.96

17.86

28.66

15.02

12.00

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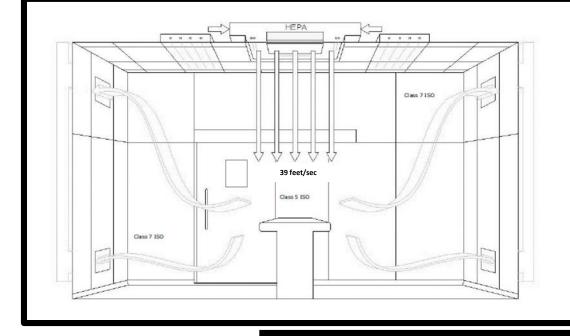
Fail

Pass



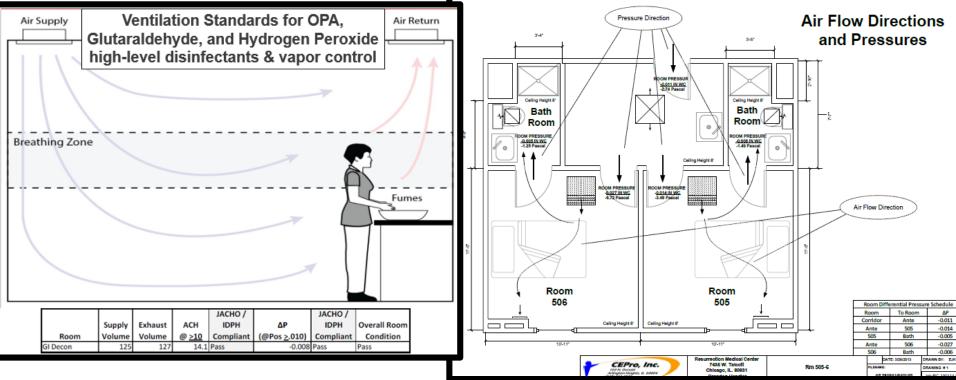
Summarization of Results

	Ventilation Compliance Testing Summary Function Space Summary																	
											F	unction	Space Su	mmary				
Room Diffe	Room Differentiation Pass / Fail Criteria (Pressures and ACH are for Max Condition) Best Practices & Recommendations																	
Hoom Dine	renduction		1 033	2	3	uliu Acri	die ioi ivii	4	,,,	5	6	7	***************************************	9	11	1		
Room / ATG Tag	Room Type	Monitor Type	Continuous Munituring Pass/Fail	Hunitur Perfurmenc e Perziffeil	Differential Pressure Passifiail	Warst Recurded Pressure (Max Made)	Room ACH Parz#Fail	Anto ACH (>10) Pazz/Fail	Batk ACH (>10) Parz/Fail	Hun Purnur Coiling	Shurt Cycle Tes#H	BAS Control Strate 47 Ter/Ho	Dadicata 4 EZH Tas/Ha	Tieu Winds U Ter/Hs	Dunr Clurer	Overall Room ParstFai	Cumplet a Rapurt	Comments
	Surgery & Critical Care R's, Ambulatory OR's, Lab OR & Delivery C Section (Pressure Requirement >0.01" wc (0.008"wc tolerance) ACH: >20)																	
OR's, Ambulatory OR'	s, Lab OR	& Delivery	C Section (P	ressure Requ	iirement >0.0	1" wc (0.00	08"wc tole	rance) ACH	: >20)									
OR #1 (1106)	Surgery	МРМ	Pass	Pass	Pass	0.0670	31.80	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	Hunitur measures from the room to the sub-sterile .0456 uc (actual pressure0499° uc)
OR #2 (1108)	Surgery	MPM	Pass	Pass	Pass	0.0705	20.40	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	Hunitur measures from the room to the sub-sterile .0426 uc (actual pressure0444" uc)
OR #3 (1117A)	Surgery	MPM	Pass	Pass	Pass	0.0636	32.50	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	Hunitur measures from the room to the sub-sterile .0422 uc (actual pressure0517" uc)
OR #4 (1112)	Surgery	МРМ	Pass	Pass	Pass	0.0316	28.40	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	Munitur measures from the room to the sub-sterile .011\$ uc (actual pressure0199" uc)
OR #5 (1115)	Surgery	МРМ	Pass	Pass	Pass	0.0586	29.60	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	Munitur measures from the room to the sub-sterile .032 uc (actual pressure039" uc)
OR #6 (1120A)	Surgery	МРМ	Pass	Pass	Pass	0.0237	41.70	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	Hunitur measures from the room to the sub-sterile .0013 uc (actual pressure0102" uc)out of claibret
OR \$7 CYSTO (1150)		МРМ	Pass	Pass	Pass	0.0177	30.90	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	Runn to hell door door not letch.
OR #8 (1149)	Surgery	мрм	Pass	Pass	Pass	0.0180	31.20	N/A	N/A	Yes	Yes	No	N/A	You	Yes	Pass	Yes	Runn to hell duar duor ant letch. Hed to change the buxrixe from 1.4 to .79 on the front and.
OR #9 (1142)		мрм	Pass	Pass	Pass	0.0498	32.00	N/A	N/A	Yes	Yes	-No	N/A	Yes	Yes	Pass	Yes	
	Surgery											140						
OR #10 (1157)	Surgery	MPM	Pass	Pass	Pass	0.0260	29.70	N/A	N/A	Yes	Yes	IVO	N/A	Yes	Yes	Pass	Yes	
OR #11 (1517)	Surgery	TSI	Pass	Pass	Pass	0.0229	29.90	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	
OR #12 (1513)	Surgery	TSI	Pass	Pass	Pass	0.0139	22.20	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	
O.B. Sergical #1 (305	Surgery	TSI	Pass	Pass	Pass	0.0220	20.40	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	0.B./Surgical \$1's Sub-Storilo is under construction.
O.B. Surgical #2 (311	Surgery	TSI	Pass	Pass	Pass	0.0120	20.60	N/A	N/A	Yes	Yes	No	N/A	Yes	Yes	Pass	Yes	0.B./Surgical \$2 and it's Sub-Storilo are under cumrtruction, these values are last years readings.
ICU, Other Sub Sterile	e/Sterile Co	orridor (Pr	essure Requi	rement >Mone] ACH: >6]													

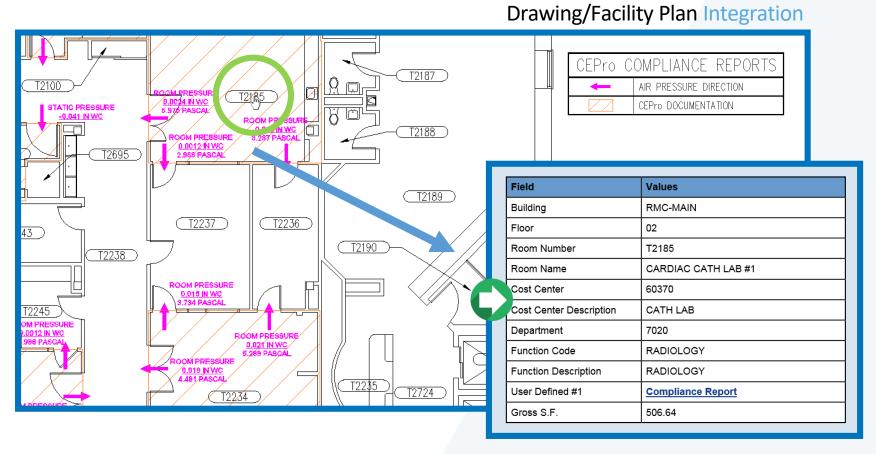


Airflow

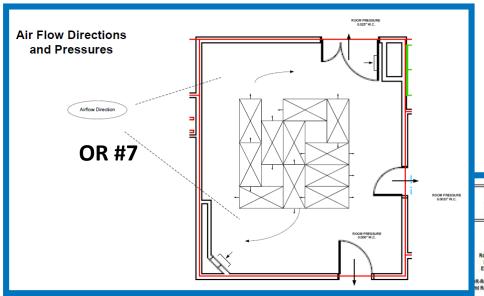
- Directional
- Laminar vs. Turbulent
- Cleanliness/CR class
- Excessive drying times
- Un-obstructions
- In/Out pressure relationship and force
- Leakage



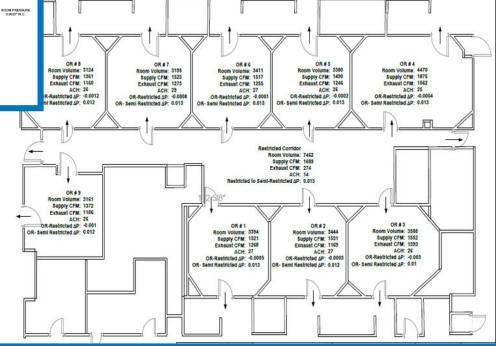


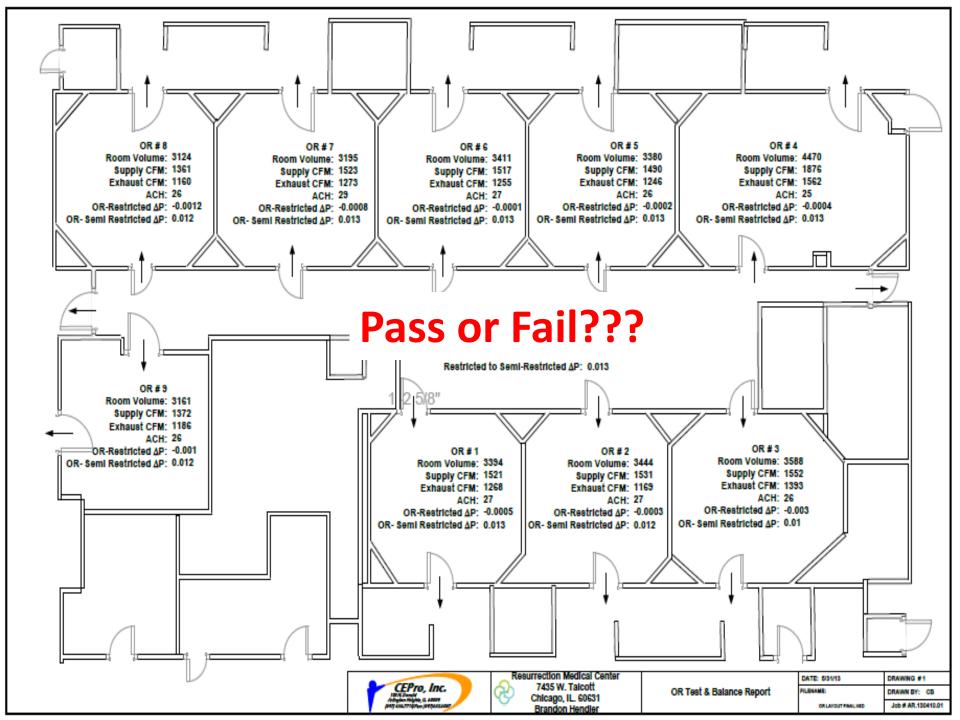


The Solution



Drawing/Facility Plan Integration







Volumes and Volumes of Certification/Compliance data updated annually at minimum....

Then there's the drawings....

Then there's the trying to find data in the future....

A Unique Value Proposition for Healthcare



Environmental Compliance platform

- Cost reduction, value add, less time in critical function space
- Integration with current space planning & department cost allocation, Environment of Care process
- On-the-spot uploading of <u>remediation</u> compliance drawings/data for <u>immediate accreditation</u> resolution
- Predictive comparatives to past years
- Expansion into all certification/ compliance processes
- Trending analysis, charting, and history reporting
- Big Data....



Individual hospital HAI financial impact is known by some....??? What would a comprehensive Environmental IP/C program ROI look like?

Developing a Comprehensive "Environmental Compliance Infection & Quality Control" Strategy

- <u>Training</u> and <u>Collaboration</u> Senior Leadership Sponsor recommendedWe offer to facilitate the training and collaboration session with your organization
- IP/C Risk Assessment & Inventory....part of the collaboration session above....
 - √ Team Assignment
 - ✓ Identification of <u>Critical Function Space & Systems</u>
 - ✓ EOC Virtual Tour
- Compliance Testing....Inventory generates Compliance Testing proposal & agreement
 - ✓ Testing Scope & <u>Baseline Agreement</u> *PASS/FAIL criteria*
 - ✓ Scheduling
 - ✓ Quality Management Toolset see more...
- Correction of Deficiencies either on the spot, immediately or plan developed together/budgeted...
 - ✓ Expedite, Develop & Implement Plan for Improvement
 - Codes, Standards, Guidelines Referenced
 - ✓ Re-Balancing
 - ✓ <u>Calibration</u> of Automation/Temperature & Vent Controls
 - ✓ Design/Budget/Build
 - ✓ New Construction/Renovation ICRA Process Support
 - ✓ Energy Efficiency Focused
 - ✓ Continuous Commissioning
- Closing the Loops
 - ✓ <u>Documentation</u> Hard Copy and/or On-Line/Cloud based <u>Technology</u> Database
 - ✓ Process Review
 - ✓ Success Metrics documented
- Low Investment, High Return significant cost efficiencies once built



- Where do I/we go from here?
- Does your organization feel confident/comfortable with your current process and its accuracy?
- What would it take to get there?
- What would the group look like to collaborate around an initiative like this? Who should be at the table?
- I offer to facilitate....





THANK YOU!



Bill Middleton – Director of Client Relations

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773-580-4401

