

#### WISCONSIN HEALTHCARE ENGINEERING ASSOCIATION

Dedicated to Excellence in Healtbcare Engineering

"Lunch & Learn" 2015 Webinar Series

#### August, 2015

# NFPA 99 RISK ASSESSMENTS



Presented By: Bill Lauzon Heather Werner

Lauzon Life Safety Consulting, LLC 262-945-4567 Lauzon.LSC@gmail.com



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Dedicated to Excellence in Healtbcare Engineering

# NFPA 99 RISK ASSESSMENTS





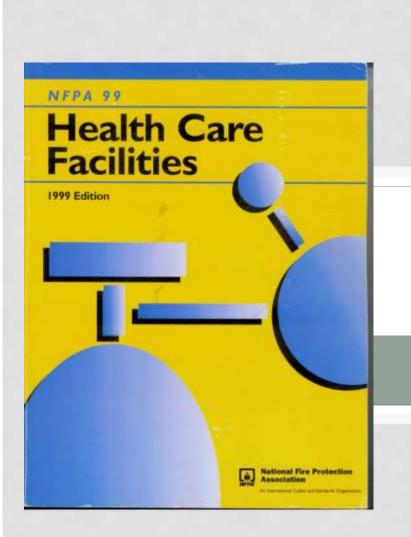
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# NFPA 99 RISK ASSESSMENTS

Presented by: Bill Lauzon



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# CURRENTLY USE NFPA 99 1999 EDITION

# BIGGEST IMPACT:NEW HOSPITALS

### **IF 2012 LSC GETS ADOPTED:**



### IF 2012 LSC GETS ADOPTED:

# MAY APPLY TO ALL HOSPITALS & NURSING HOMES

#### NFPA 99

**2012 Edition** 

#### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements



**Requirements Change From:** 

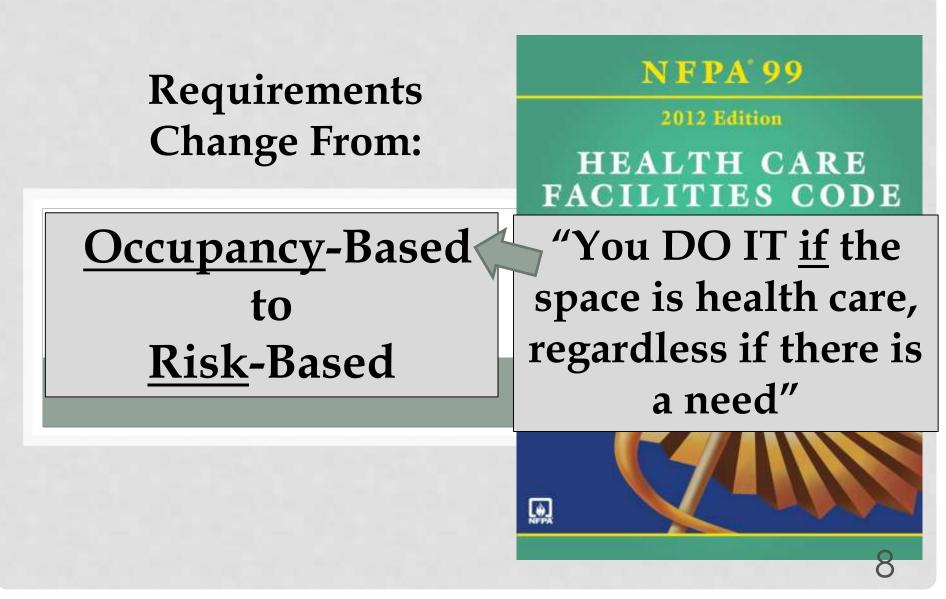
Occupancy-Based to <u>Risk</u>-Based NFPA 99

**2012 Edition** 

#### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements







#### In other words:

You get to evaluate which requirements apply to your situation

#### NFPA 99

**2012 Edition** 

#### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements



### **REORGANIZED CHAPTERS**

#### NFPA'99

**2012 Edition** 

#### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements



### **Re-Organized Chapters**

<u>1999</u>

- **3 Electrical Sys**
- 4 Gas & Vacuum
- 5 Envir
- 6 Materials
- 7 Elec Equipment
- 8 Gas Equipment
- 9 Mfr Requirements
- 10 Laboratories
- 11 Emergency Prep
- 12 Hospital
- 13 Other Health
- **16 Nursing Home**
- 17 Limited Care
- 18 Home Care
- 19 Hyperbaric



- 4 Risk Assessment
- 5 Gas & Vacuum
- 6 Electrical Sys
- 7 Info Technology
- 8 Plumbing
- 9 HVAC
- 10 Elec Equipment
- 11 Gas Equipment
- 12 Emergency Mgmt
- 13 Security Mgmt
- 14 Hyperbaric
- **15 Features of Fire Prot**





### **9** <u>Gone</u>

#### <u>1999</u>

- **3 Electrical Sys**
- 4 Gas & Vacuum
- 5 <del>Envir</del>
- 6 <del>Materials</del>
- 7 Elec Equipment
- 8 Gas Equipment
- 9 Mfr Requirements-
- 10 <del>Laboratori</del>es
- 11 Emergency Prep
- 12 <del>Hospital</del>
- 13 <del>Other Health</del>
- 16 Nursing Home
- 17 Limited Care
- 18 <del>Home Care</del>
- 19 Hyperbaric

#### <u>2012</u>

- 4 Risk Assessment
- 5 Gas & Vacuum
- 6 Electrical Sys
- 7 Info Technology
- 8 Plumbing
- 9 HVAC
- 10 Elec Equipment
- 11 Gas Equipment
- 12 Emergency Mgmt
- 13 Security Mgmt
- 14 Hyperbaric
- **15 Features of Fire Prot**





### 6 <u>New</u>

<u>1999</u>

- **3 Electrical Sys**
- 4 Gas & Vacuum
- 5 Envir
- 6 Materials
- 7 Elec Equipment
- 8 Gas Equipment
- 9 Mfr Requirements
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#### <u>2012</u>

- 4 Risk Assessment
- 5 Gas & Vacuum
- 6 Electrical Sys
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- 9 HVAC
- 10 Elec Equipment
- 11 Gas Equipment
- 12 Emergency Mgmt
- 13 Security Mgmt
- 14 Hyperbaric
- **15 Features of Fire Prot**





### 6 <u>Re - Arranged</u>

#### <u>2012</u>



- 4 Risk Assessment
- **≻5 –** Gas & Vacuum
  - **6 Electrical Sys**
  - 7 Info Technology
  - 8 Plumbing
  - 9 HVAC
- **10 Elec Equipment**
- **11 –** Gas Equipment
- →12 Emergency Mgmt
  - 13 Security Mgmt
  - **14 Hyperbaric**
  - **15 Features of Fire Prot** 
    - 15

<u>1999</u>

- 3 Electrical Sys 、
- 4 Gas & Vacuum –
- 5 Envir
- 6 Materials
- 7 Elec Equipment
- 8 Gas Equipment
- 9 Mfr Requirements
- 10 Laboratories
- 11 Emergency Prep —
- 12 Hospital
- 13 Other Health
- **16 Nursing Home**
- 17 Limited Care
- 18 Home Care
- **19 Hyperbaric**

## HIGHLY RECOMMENED

### **Buy the Handbook**

Explanations of the <u>many</u> changes

- Expert insights
- Descriptive photos
- Helpful tables & charts

More expensive, but well worth it

#### NFPA<sup>°</sup>99

#### **2012 Edition**

#### HEALTH CARE FACILITIES CODE HANDBOOK

Edited by Richard P. Bielen, PE • James K. Lathrop, FSFPE



# NFPA'99 2012 Edition HEALTH CARE FACILITIES CODE Including all Gas & Vacuum System Requirements

#### NFPA Members: 10% discount

#### NFPA<sup>\*</sup>99

#### **2012 Edition**

#### HEALTH CARE FACILITIES CODE HANDBOOK

Edited by Richard P. Bielen, PE . James K. Lathrop, FSFPE

#### **\$70.50 – Book or PDF**

17



\$151 – Book or PDF

### BOOK

- Easy to flip to referenced sections
- Can copy & show others III Gas & Vacuum

# FACILITIES PDF

Easy to search for topics

NFPA 99

HEALTH C.

#### HEALTH CARE FACILITIES CODE HANDBOOK

Edited by Richard P. Bielen, PE • James K. Lathrop, FSFPE

### **NFPA Free Access**

Free •

18

- Non-seachable •
- Non-copiable
- Non-flippable

### **TODAY'S FOCUS**

9

#### Chapter 4

## Risk Assessment

#### NFPA 99

2012 Edition

#### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements



### **RISK ASSESSMENT**

# It guides the <u>use</u> of the other chapters

**Not:** IT, Emerg & Security Mgmt, Fire Protection

#### NFPA 99

2012 Edition

#### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements



#### <u>2012</u>

- 4 Risk Assessment
- 5 Gas & Vacuum
- 6 Electrical Sys
- 7 Info Technology
- 8 Plumbing
- 9 HVAC
- 10 Elec Equipment
- 11 Gas Equipment
- -12 Emergency Mgmt
- 13 Security Mgmt
- 14 Hyperbaric
- **-**15 Features of Fire Prot

#### HEALTH CARE

Including all Gas & Vacuum System Requirements

**NFPA 99** 

2012 Edition



Not to:

Chapter 4

RISK

ASSESSMENT

**Applies to:** 

21

### 4.1 – Building Systems Categories



### Consider equipment operation <u>NOT</u> Intervention by people

### 4.1 – Building Systems Categories Consider equipment operation NOT intervention by people

### **SEVARITY OF FAILURE**

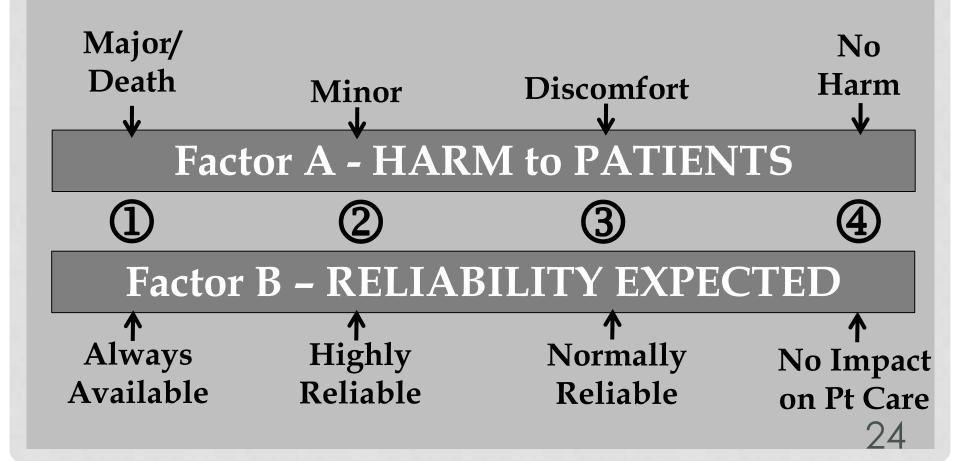
- Harm to Patients
- Harm to Staff & Visitors

### **RELIABILITY**

- Importance of redundancy
- **Probability of system failure**
- Levels of sedation
- Complexity of treatment

### 4.1 – Building Systems Categories

### Consider <u>worst-outcome</u> scenario of a failure impact



# 4.1 – Building Systems Categories Evaluate <u>effect of failure</u>, Based on harm to patients, staff & visitors

Failure may cause death or serious injury Failure limited to minor injuries

**3** Failure may cause discomfort

No impact on patients or caregivers

# 4.1 – Building Systems Categories Evaluate <u>potential for failure</u>, Based on system reliability



Failure likely to cause major injury/death

Available at all times for life-support systems

System must always work (life support)

### **Major injury**

- Any amputation
- Loss of sight, or injury to eye
- Unconsciousness that requires resuscitation, medical treatment, or hospital admit
- Acute illness from biological agents

Failure likely to cause major injury/death

Available at all times for life-support systems

System must always work (life support)

- Emergency power to OR's
- Medical gas system in ICU
- Ventilator-assisted procedure in a MOB
- Cardiac cauterization imaging equipment

### Failure likely to cause minor injury



Failure limited to minor injuries

High Reliability Expected

### **Minor injury**

- Not serious
- Not involving risk to life

### Failure likely to cause minor injury

#### 2

Failure limited to minor injuries

High Reliability Expected

- Task or procedural lighting in patient rooms
- Potable water in the patient care areas

Failure not likely to cause injury, but may cause discomfort

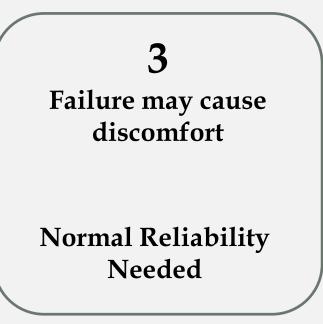


Failure may cause discomfort

Normal Reliability Needed

- Heating system in southern US
- Humidity control in nonoperating areas
- Dental drill
- Motorized bed adjustments
- Cooling tower makeup water in nw US

# Failure would have no impact on patient care



- Gray water lawn sprinkling
- Seasonal lighting systems
- Public address system
- Pneumatic tube systems
- Vacuum systems in a research area

### **RISK ASSESSMENT**

Must follow & document according to a <u>DEFINED</u> risk assessment procedure

**Examples:** 

ISO 31010 – Risk Assessment Techniques NFPA 551 – Guide for Eval of Fire Risk Assessments SEMI S10-0307E – Guidelines for Risk Assess & Eval

**Other formal process** 

NFPA 99

2012 Edition

HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements



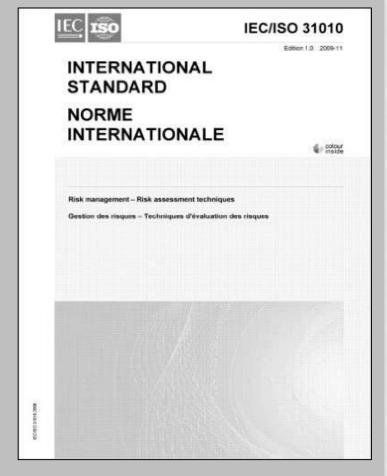
**ASHE Risk Tool** 

## **ISO 31010 - RISK ASSESSMENT**

Risk assessment is part of the core elements of risk management

- Communication and Consultation
- Context establishment
- <u>Risk Assessment</u>, includes: Risk identification, Risk analysis & Risk evaluation
- Risk treatment
- Monitoring and review

Risk can be assessed at any level of a facility's operations or goals.



# **ISO 31010 - RISK ASSESSMENT**

There are 31 risk assessment techniques in Annex B of ISO/IEC 31010

\$298

192 pages

softcover

- Brainstorming
- Full & semi-structured i
- Dephi method
- Checklist
- Preliminary hazard analysis
- Hazard & operability study
- Hazard analysis & critical cont pts
- Toxicity assessment
- Structured "What-If" technique
- Scenario analysis
- Business impact analysis
- Root cause analysis
- Failure mode & effects analysis
- Fault tree analysis
- Event tree analysis
- Cause & consequence analysis

#### A<u>mazon</u> Cause & effect analysis

- Layer protection analysis
- Decision tree
- Human reliability analysis
- Bow tie analysis
- Reliability centered maintenance
- Sneek circuit analysis
- Markov analysis
- Monte Carlo simulation
- Bayesian statistics & Bayes nets
- FN curves
- Risk index
- Consequence/probability matrix
- Cost/benefit analysis
- Multi-criterial decision analysis

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- Monte Carlo simulation
- Bayesian statistics & Bayes nets
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- Cost/benefit analysis
- Multi-criterial decision analysis

### NFPA 551- FIRE RISK ASSESSMENT

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Annex	A Explanatory Material	
Annex	B Informational References	\$45 at NFPA
Index		30 pages
		softcover

# SUPERSEDED BY SEMI S10-0215



SEMI<sup>®</sup> International Standards

SEMI: Semi-Conductor Equipment & Materials International

> \$300 at SEMI online download

Systems Risk A	ssessment for	, , , , , , , , , , , , , , , , , , , ,		1		ASH Chapters	<b>~</b> >•
Category Legend	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 9	10 and 11	Chapter 1
Room Name OR 1	<b>NSTRU</b>	JC]	ΓIO	Mater able Water able Water eating eating eating Non-Medical Compressed Air Non-Medical Compressed Air Black Waste Water S Gray Waste Water	Heating Heating Ventilation	Equipment (See Equipment tab.)	Emergency Management
5 M	WORI	~~	HEE	TS			
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#### NFPA 99-2012 Risk Assessment Tool

Instructions for Using the ASHE NFPA 99 Risk Assessment Tool

Prior to implementing this risk assessment tool, the following steps should be taken:

1. Establish a multidisciplinary team with knowledge of the facility's space use, patient care services, clinical practices, and other areas as appropriate.

 Familiarize the team with the risk category definitions found in chapters 4 (Fundamentals) and 12 (Emergency Management) of NFPA 99-2012: *Health Care Facilities Code*. These definitions are included in the category legends on each worksheet; mouse over the "Category Legends" box to see them.

3. Familiarize the team with the ways in which system and equipment operab

This risk assessment tool contains three worksheets (Systems, Equipment, ar on the worksheet tabs below.

## "Instructions" explains how to use the <u>3 worksheets</u>

ASHE

Systems Worksheet - This worksheet is used to record the level of risk determined for the listed systems in a given area (room or spaces within a room) of the facility being evaluated. Indicate the risk level with an NFPA 99 risk category number (see the Category Legend for details).

Room Name: Enter the unique identification information for the room being evaluated (i.e., room name or number). Room Number: Enter the room number, if applicable.

Space: Enter the unique identification information for the space in a room that is being evaluated (e.g., the charting area in a recovery area).

Chapter 5: Enter the risk category for the various components of the medical gas and vacuum systems in the room or space being evaluated.

Chapter 6: Enter the risk category for the electrical system in the room or space being evaluated.

Chapter 7: Enter the risk category for the various components of the IT and communications systems in the room or space being evaluated.

Chapter 8: Enter the risk category for the various components of the **plumbing systems** in the room or space being Chapter 9: Enter the risk category for the various components of the **HVAC systems** in the room or space being evaluated. Chapter 10: Indicated on this worksheet for information only - to be assessed on the Equipment worksheet.

Chapter 12: Indicated on this worksheet for information only - to be assessed on the Emergency Management Note: Categories assigned in the chapter columns listed above are based on categories as outlined in Chapter 4 of NFPA 99-2012.

1	Category Legend	s Risk Asses				_																-	_			
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					/												5						•			t tab
Re	oom Name	e # Spa 1021	Space	Oxygen	Medical Air	Vacuum	WAGD	Electrical Systems	Data	Phone	Nurse Call	Cable TV	Potable Water	Non-Potable Water	Water Heating	Water Conditioning	Non-Medical Compressed	Black Waste Water	Gray Waste Water	Clear Waste Water	Heating	Ventilation	Air-Conditioning	Equipment See Environment tab 1	Emergency Management	Sea Emerson Manasoment
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C16	1	Facility systems in which failure of such equipment or system is likely to cause major injury or death of patients or caregivers shall be designed to meet system Category 1 requirements as defined in this code.
Electri	2	Facility systems in which failure of such equipment is likely to cause minor injury to patients or caregivers shall be designed to meet system Category 2 requirements as defined in this code.
Equipment	3	Facility systems in which failure of such equipment is not likely to injury to patients or caregivers but can cause discomfort to patients shall be designed to meet system Category 3 requirements as defined in this code.
	4	Facility systems in which failure of such equipment would have no impact on patient care shall be designed to meet system Category 4 requirements as defined in this code.
Lawn Mower      Lawn Mower      L		2-93w 2. <u>"Equipment" worksheet</u> is used to enter & record the Risk Category # for facility equipment
7 8 9 0 0 1 2 3 4		
		Equipment Emergency Management 22

	A	В	С	D
1	Emergency Mana	igeme	nt Tool	
2		_		Ŭ
3		1	Those inpatient facilities that remain operable to provide advanced life support services to injured responders and disaster victims. These facilities manage the existing inpatient load as well as plan for the influx of additional patients as a result of an emergency.	
4		2	Those inpatient or outpatient facilities that augment the critical mission. These facilities manage the existing inpatient or outpatient loads but do not plan to receive additional patients as a result o an emergency.	f
5				-
6	Building	Category	Notes	
7		<b>.</b>		
8				
9 10			3. <u>"Emergency Mgmt" worksheet</u>	
11 12			used to enter & record the Risk	
			Assessment for <u>buildings</u>	
			nent Worksheet - This tool is used to record the building category from NFPA 99 Table 12.3 assigned to each building.	
	Buildin	g: Enter the n	ame or identifying information for the building.	

Matrix) in Chapter 12 of NFPA 99-2012.

# ASHE- HAZARD VULNERABILITY ANALYSIS

	Prob	ability	of Fail	ure or		Risk If	Fails or Does I	Not Exist		Pre	paredn	ess			
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ASHE \_ Annual Conference Dispatch Seven Steps to Risk Assessments Conducting risk assessments and failure mode and effects analyses Middle

An INCOME.

Article from: "Inside ASHE" Summer 2015 issue

> ASHE Conference presentation by George Mills, TJC

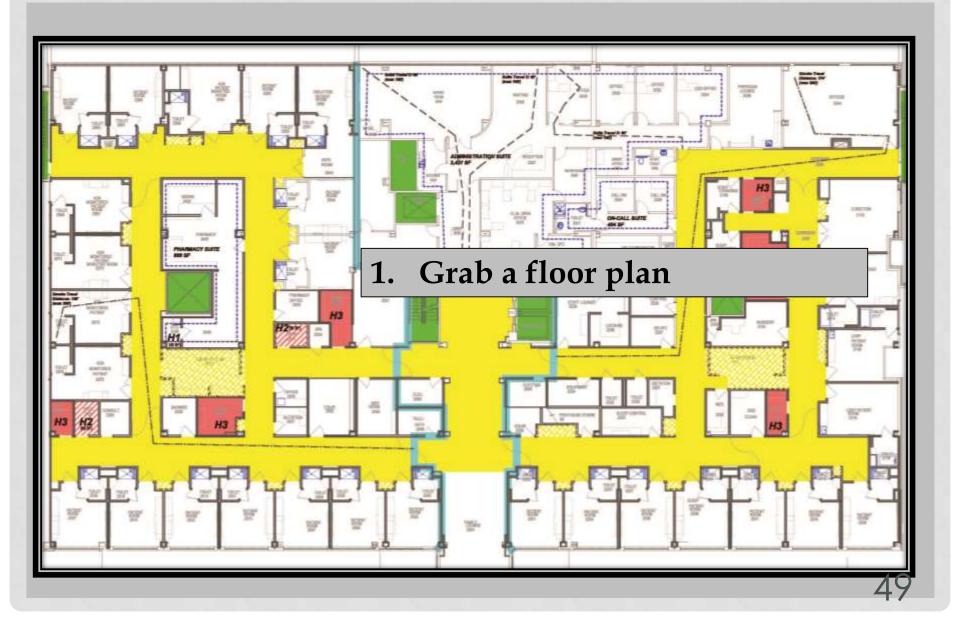
Hospitals need to do risk assessments <u>NOW</u> for compliance with:

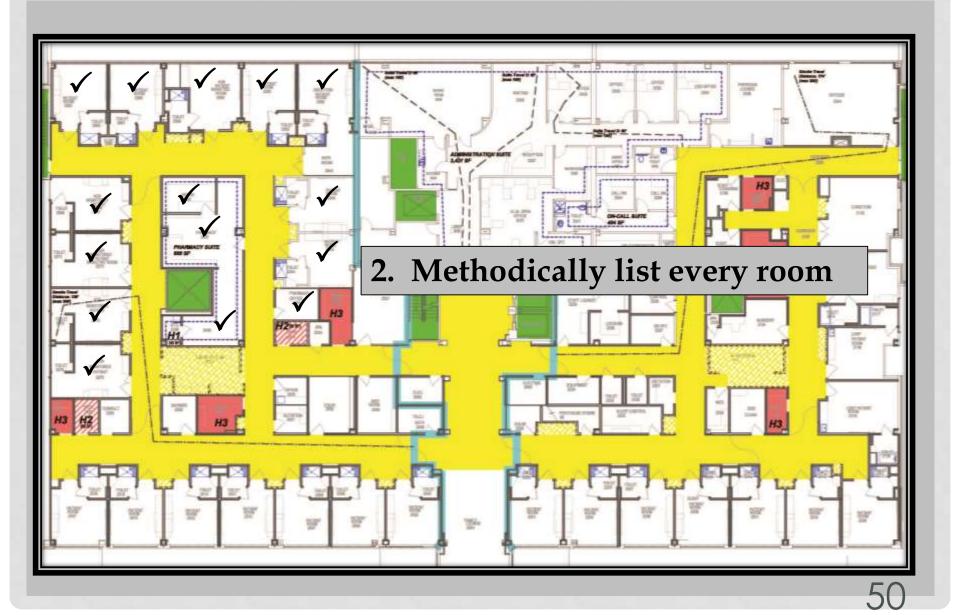
EC.02.01.01 EP 1 – Identify Risks EC.02.01.01 EP 3 – Take Action

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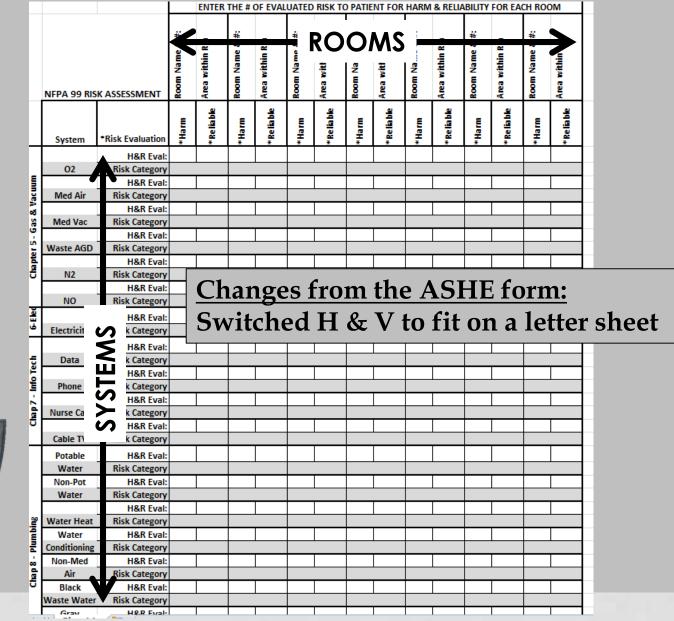
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3	Room Name	Room #	Space	Oxygen	Medical Air	Vacuum	WAGD	Electrical Systems	Data	Phone	Nurse Call	cable TV	Potable Water	Non-Potable Water	W ater Heating	Water Conditioning	Non-Medical Compressed Air	Black Waste Water	Gray Waste Water	Clear Waste Water	Heating	Ventilation	Air-Conditioning	Equipment	(See Equipment tab.)	Emergency Management	(See Emergency Management tab.)
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6	Patient Room	2355																									
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9	Patient Room	2348							5		. •		· <b>y</b>	₽	U	JI.											
10	Patient Room	2343																									
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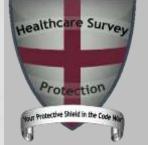
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5	Patient Room	2380		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3			
6	Patient Room	2355		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3			
7	Patient Room	2352		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3			
8	Patient Room	2350		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3			
9	Patient Room	2348		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3			
10	Patient Room	2343		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3			
11	,	2401		0	0	0	0	3	3	3	0	0	3	0	3	3	0	0	0	0	3	3	3			
	Pharmacy Process	2408		0	0	0	0	3	3	3	0	0	3	0	3	3	0	0	0	0	3	3	3			
	Pharmacy Storage	2407		0	0	0	0	3	3	3	0	0	3	0	3	3	0	0	0	0	3	3	3			
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15	Patient Room	2368		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3			
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17	Patient Room	2372		2	2	2	0	2	0	3 3	2	3	2	0	3	3	0	0	0	0	2	3	3			
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5	Patient Room	2380		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3						
6	Patient Room	2355		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3						
7	Patient Room	2352		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3						
8	Patient Room	2350		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3						
9	Patient Room	2348		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3						
	Patient Room	2343		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3						
	Pharmacy Office	2401		0	0	0	0	3	3	3	0	0	3	0	3	3	0	0	0	0	3	3	3						
	Pharmacy Process	2408		0	0	0	0	3	3	3	0	0	3	0	3	3	0	0	0	0	3	3	3						
	Pharmacy Storage	2407		0	0	0	0	3	3	3	0	0	2	0	2	3	0	0	0	0	3	3	3						
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	Patient Room	2368 2370		2	2	2	0	2	0	3	2	3	2	0	3	3	0	0	0	0	2	3	3						
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## **LLSC- RISK ASSESSMENT**





## LLSC- RISK ASSESSMENT

				ENTER	THE #	OF EVAL	UATED	RISK TO	) PATIE	NT FOR	HARM	& RELIA	BILITY	FOR EA	CH ROO	M
	NFPA 99 RIS	K ASSESSMENT	Room Name & #:	Rrea within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm
	System	•Risk Evaluation	*Harm	*Reliable												
		H&R Eval:														
	02	Risk Cater			į					1						
5		H&R al														
Vacuum	Med Air	Risk Ca gory														
8		H&I Eval:														
Se	Med Vac	Risk Cal gory														
9		H&R Eval:														



Added lines to document the "harm" & "reliability" evaluations

## **LLSC- RISK ASSESSMENT**

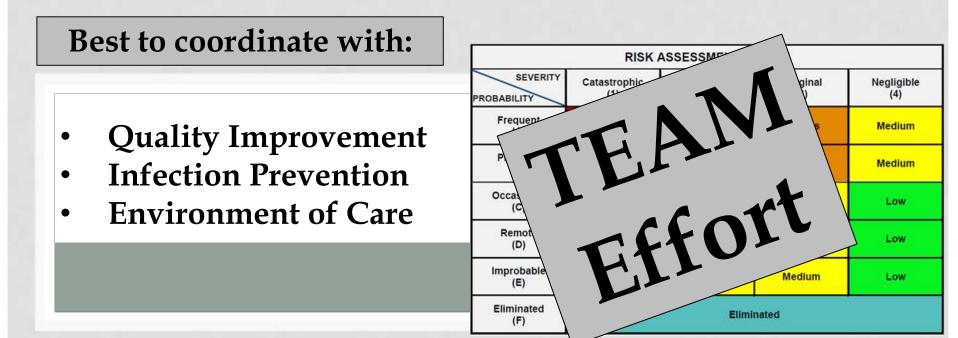
				ENTER	THE #	OF EVAL	UATED	RISK T	D PATI	ENT FOR	HARN	1 & RELI	ABILITY	FOR EA	CH RO	ом
	NFPA 99 RIS	K ASSESSMENT	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm	Room Name & #:	Area within Rm
	System	*Risk Evaluation	*Harm	*Reliable												
		H&R Eval:														
	02	Risk Category														
		H&R Eval:														
Vacuum	Med Air	Risk Category														
8. V		H&R Eval:														
Gas &	Med Vac	Risk Category														
		H&R Eval:														
Chapter 5 -	Waste AGD	Risk Category								_		-				
apt		H&R Eval:														
Ð	N2	Risk Category		-		-						_		-		
		H&R Eval:														
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9	Electricity	Risk Category														
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e,	Data	Risk Category														
- Info Tech		H&R Eval:														
Ť.	Phone	Risk Category				_										
5		H&R Eval:														
Chap 7	Nurse Call	Risk Category		_												
Ū		H&R Eval:														
	Cable TV	Risk Category										_		_		-
	Potable	H&R Eval:														
	Water	Risk Category														
	Non-Pot	H&R Eval:														
	Water	Risk Category				1	<b>~•1</b>			• 1	1 1		•			• 1
		H&R Eval:		Η	XC	el		e a	va	1 <b>a</b>	bl	e v	1 <b>a</b>	e-1	na	1 1
jing	Water Heat	Risk Category														
E.	Water	H&R Eval:		Ц							Ia	117	nr	n.L	SC	0
Pla	Conditioning	Risk Category		-							La	uZ	01			_@ <b>}</b>
Chap 8 - Plumbing	Non-Med	H&R Eval:			-	I	-	1	-	I	-	1	-	I	-	1
a l	Air	Risk Category		1		1		1		1		1		1		1
9	Black	H&R Eval:				<u> </u>										
	Waste Water			1		1		1		1				1		1
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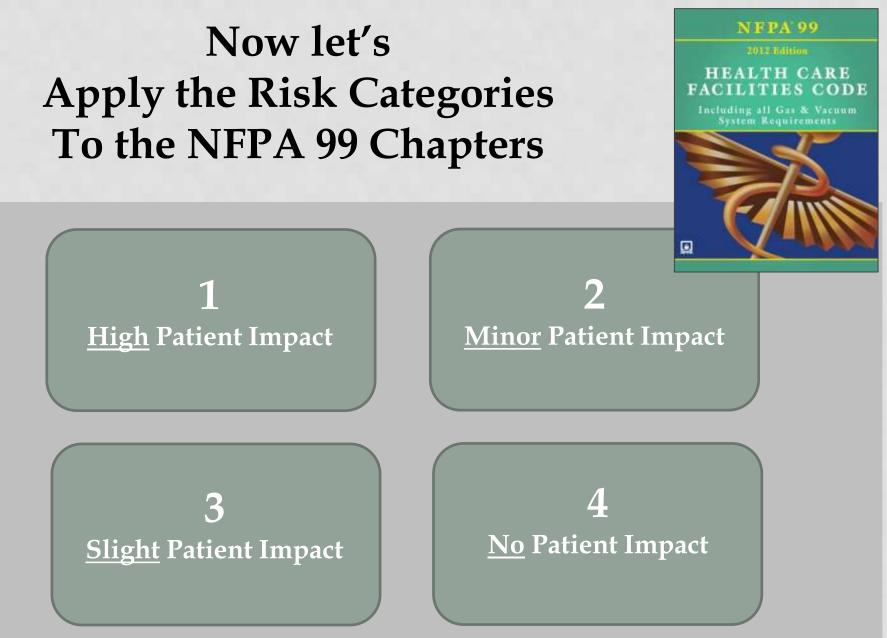
## NFPA 99 - RISK ASSESSMENT

### **Develop a <u>uniform</u> Risk Assessment process**



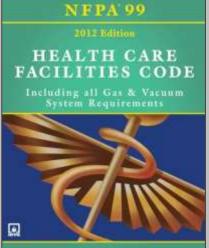
They usually have experience in risk assessments

With this         3       Room Name       #         4       Patient Room       238       juncle of number of numbers       3       0       0       0       0       2       3       3         6       Patient Room       235       2       2       0       3       2       3       2       0		А	B C	DE	F (	G H	I J	K L	Μ	N C	) P	Q	R S	6 Т	U	v v	V X Y Z	AA AB AC
2       Category Legend       Chapter 5       Chapter 5       Chapter 5       Chapter 7       Chapter 7       Chapter 8       Chapter 9       10 and 11       Chapter 1         3       Room Name       #       WHAAT do you	1	Systems Ris	sk Asses	smen	nt To	ol											ASH	E >
WHAT do you do with this         3 Room Name         #       patient Room       23         5       Patient Room       23         7       Patient Room       235       2       2       0       3       2       3       3       0       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       3       0       0       0       2       3       3       0       0       1       2       3       3       3	2	Category Legend		Cha	pter 5	Chapter	6 Chai	oter 7			Chai	oter 8	}		Cha	apter 9		Chapter 12
4       Patient Room       238       2       0       2       3       2       3       2       0       3       2       3       2       0       3       3       3       3         6       Patient Room       2355       2       2       0       2       0       3       2       3       2       0       3       3       3       3       3         7       Patient Room       2352       2       2       0       2       0       3       2       3       2       0       3       0       0       0       2       3       3         9       Patient Room       2350       2       2       0       2       0       3       2       3       2       0       3       3       0       0       0       2       3       3         9       Patient Room       2348       2       2       0       2       3       3       0       0       0       0       2       3       3       3       0       0       0       2       3       3       3       3       0       0       0       0       3       3				W	Ή				-			1	d	0		Anditioning	onent pment	ergency Management Emergency Management tab.)
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5       Patient Room       23         6       Patient Room       235       2       2       0       2       0       3       2       0       3       2       0       3       3       0       0       0       0       2       3       3         7       Patient Room       2350       2       2       0       2       3       2       0       3       2       0       3       3       0       0       0       0       2       3       3         7       Patient Room       2350       2       2       0       2       0       2       3       2       0       3       2       0       3       3       0       0       0       0       2       3       3         9       Patient Room       2348       2       0       2       3       2       0       3       2       0       3       3       0       0       0       2       3       3       3       2       0       3       3       0       0       3       3       3       0       0       0       0       2       3       3       3       3<	4	Patient Room	238	111	LL	16	UI		LL	11		U		LD		3		
0       Patient Room       2352       2       2       2       0       3       2       3       2       0       3       3       0       0       0       2       3       3         7       Patient Room       2350       2       2       0       2       0       3       2       3       2       0       3       3       0       0       0       2       3       3         9       Patient Room       2348       2       2       0       2       0       3       2       3       3       0       0       0       2       3       3         10       Patient Room       2343       2       2       0       2       0       3       2       3       3       0       0       0       2       3       3         10       Patient Room       2343       2       2       0       2       0       3       3       0       0       0       0       2       3       3       3       0       0       0       0       3       3       3       0       0       0       0       0       0       0       0       <	5	Patient Room		_			_									3		
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9       Patient Room       2348       2       2       2       0       2       0       3       2       3       3       0       0       0       2       3       3         10       Patient Room       2343       2       2       2       0       2       3       2       0       3       3       0       0       0       0       2       3       3         11       Pharmacy Office       2401       0       0       0       3       3       0       0       0       0       0       3       3       3       0       0       0       3       3       3       0       0       0       0       0       0       3       3       3       0       0       0       0       0       3       3       3       0       0       0       0       0       0       3       3       3       0       0       0       0       0       3       3       3       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0       0	7	Patient Room	2352	2 2	2	2	0 3	2 3	2	0 3	3	0	0 0	0	2	3 3		
y attent Room       2343       2       2       0       2       0       2       0	8	Patient Room	2350	2 2	2 (	) 2	0 3	2 3	2	0 3	3	0	0 0	0	2	3 3		
11       Pharmacy Office       2401       0       0       0       3       3       3       0       0       3       3       3       3       0       0       3       3       3       3       1       1       Pharmacy Office       2401       0       0       0       3       3       3       0       0       3       3       3       3       1       1       Pharmacy Process       2408       0       0       0       3       3       3       0       0       3       3       3       3       0       0       0       3       3       3       0       0       3       3       3       3       0       0       3       3       3       3       0       0       0       3       3       3       0       0       3       3       3       3       0       0       0       3       3       3       3       0       0       0       0       0       3       3       3       0       0       0       0       3       3       3       3       3       3       3       3       3       3       3       3       3       3	9	Patient Room	2348	2 2	2 (	) 2	0 3	2 3	2	0 3	3	0	0 0	0	2	3 3		
12       Pharmacy Process       2408       0       0       0       3       3       3       0       0       3       3       3       3       3       3       0       0       0       0       3       3       3       3       0       0       0       0       0       3       3       3       0       0       0       0       0       3	10	Patient Room	2343	2 2	2 (	) 2	0 3	2 3	2	0 3	3 3	0	0 0	0	2	3 3		
12       Pharmacy Process       2408       0       0       0       0       0       0       0       0       0       3       3       0       0       0       0       3       3       0       0       3       3       0       0       0       0       0       3       3       0       0       3       3       0       0       3       3       3       0       0       0       0       3       3       3       0       0       3       3       3       0       0       0       3       3       3       0       0       0       0       3       3       0       0       3       3       3       0       0       0       3       3       3       0       0       0       0       3       3       3       0       0       0       3       3       3       0       0       0       0       3       3       3       0       0       0       0       3       3       3       0       0       0       0       2       3       3       3       0       0       0       0       0       2       3       3	11	Pharmacy Office	2401	0 0	0 (	3	3 3	0 0	3	0 3	3 3	0	0 0	0	3	3 3		
14       Pharmacy Mixing       2402       0       0       0       3       3       3       0       0       3       3       3       3       3       0       0       3       3       3       3       0       0       3       3       3       3       3       3       0       0       0       0       3	12	Pharmacy Process	2408	0 0	0 (	) 3	3 3	0 0	3	0 3	3 3	0	0 0	0	3	3 3		
14       Pharmacy Mixing       2402       0	13	Pharmacy Storage	2407	0 0	0 (	) 3	3 3	0 0	3	0 3	3 3	0	0 0	0	3	3 3		
16       Patient Room       2370       2       2       2       0       2       0       3       2       3       2       0       0       0       0       0       2       3       3         17       Patient Room       2372       2       2       2       0       2       3       3       3       0       0       0       2	14	Pharmacy Mixing	2402	0 0	0 (	) 3	3 3	0 0	3	0 3	3 3	0	0 0	0	3	3 3		
17 Patient Room 2372 2 2 2 0 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	15	Patient Room	2368	2 2	2 (	) 2	0 3	2 3	2	0 3	3	0	0 0	0	2	3 3		
17 Patient Room 2372	16	Patient Room	2370	2 2	2 (	) 2	0 3	2 3	2	0 3	3 3	0	0 0	0	2	3 3		
18 Patient Poom 2275 2 2 0 2 0 3 2 3 2 0 3 3 0 0 0 0 2 3 3	17	Patient Room	2372	2 2	2	22		2 3	-2	_02		0	0_0	0	2	3 3		
	18	Patient Room	2375	2 2	2	2	0 3	2 3	2	0 3	3	0	0 0	0	2	3 3		



### **Applying the Risk Categories**

<ul> <li>5 - Gas &amp; Vacuum</li> <li>6 - Electrical Sys</li> <li>7 - Info Technology</li> <li>8 - Plumbing</li> <li>9 - HVAC</li> <li>10 - Elec Equipment</li> <li>11 - Gas Equipment</li> </ul>	Apply
12 – Emergency Mgmt 13 – Security Mgmt 14 – Hyperbaric 15 – Features of Fire Prot	↑ Not Apply



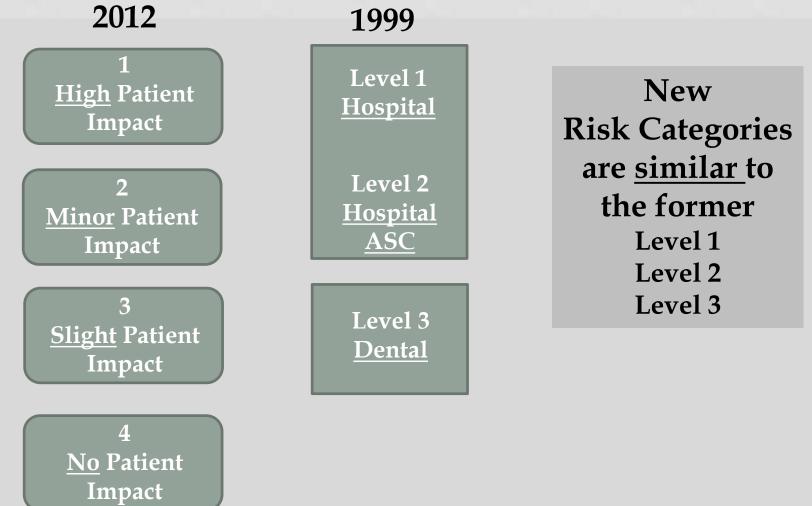


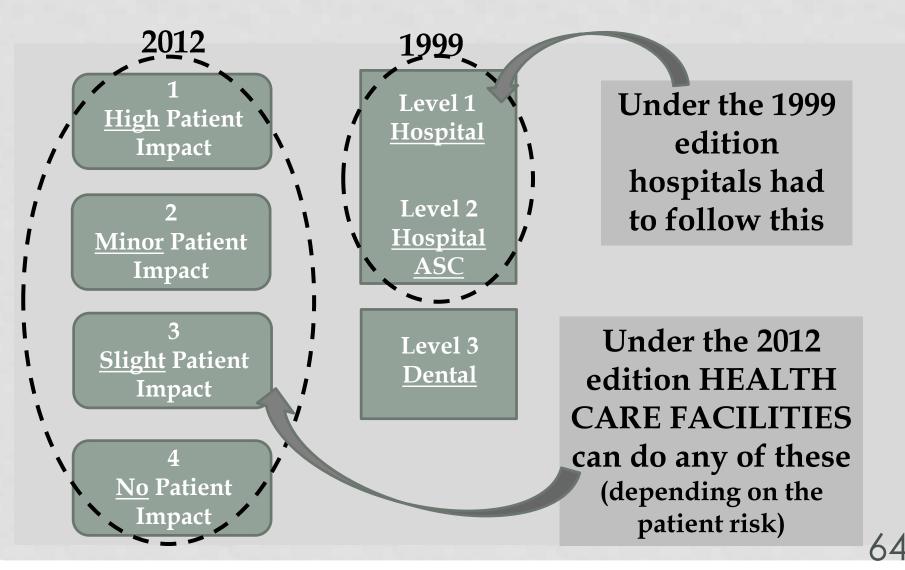
### Organized by Risk Category requirements

(not retroactive, except for operation & management requirements)

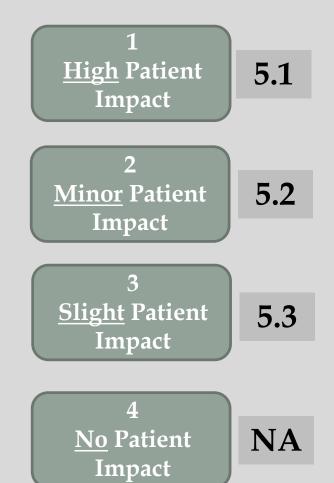


Topic	Category 1 Systems	Category 2 Systems	Category 3 Systems
Applicability	5.1.1	5.2.1	5.3.1
Nature of Hazards	5.1.2	5.2.2	5.3.2
Sources	5.1.3	5.2.3	5.3.6.21/5.3.7
Valves	5.1.4	5.2.4	5.3.6.19
Station Outlet/Inlets	5.1.5	5.2.5	5.3.6.18
Manufactured Assemblies	5.1.6	5.2.6	NA
Surface-Mounted Medical Gas Rails (MGR)	5.1.7	5.2.7	NA
Pressure and Vacuum Indicators	5.1.8	5.2.8	NA
Warning Systems	5.1.9	5.2.9	5.3.6.22
Distribution	5.1.10	5.2.10	5.3.7/5.3.8
Labeling and Identification	5.1.11	5.2.11	5.3.11
Performance Criteria and Testing -	yours bee multim	- Inside we - lucette	
Gases, Medical–Surgical Vacuum, and WAGD	5.1.12	5.2.12	5.3.6.23/5.3.9
Operation and Management	5.1.14	5.2.13	5.3.13





### 5.X.14 - MAINTENANCE

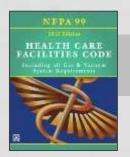


<u>Inventory</u> includes all sources, control valves, alarms & mfr assemblies

Must have <u>scheduled inspections</u> based on risk assessment & OEM recommendations (minimum annual). Very prescriptive lists of what must be included.

Maintainers must be <u>qualified</u> by training or credentialing

# NFPA 99 – <u>CHAPTER 6</u> ELECTRICAL SYSTEMS



## Not organized by Risk Categories

Similar to 1999 standard

Still organized by the "<u>Type</u>" of EES



Code lists which sections are retroactive, such as GFI, # receptacles, OR wet locations

### NFPA 99 – CHAPTER 6 ELECTRICAL SYSTEMS

BIG change: ORs are now a "<u>wet</u>" environment by default

### Unless a Risk Assessment determines otherwise

#### NFPA 99

**2012 Edition** 

#### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements



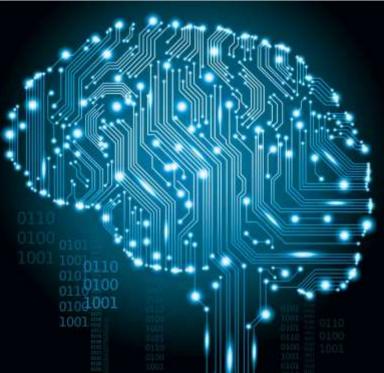
6.3.2.2.8.4 (not retroactive)

# NFPA 99 – <u>CHAPTER 7</u> INFO TECHNOLOGY SYSTEMS

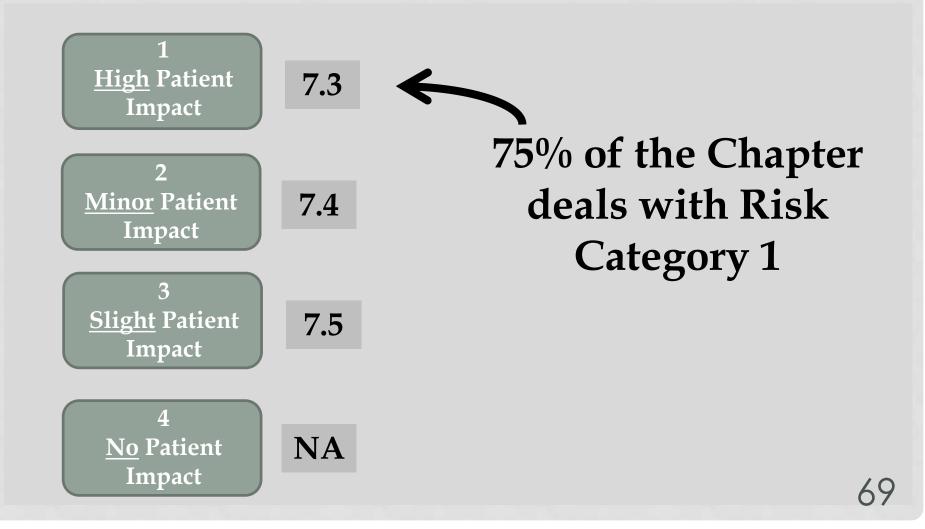
### **<u>NEW</u>** Chapter Organized by Risk Categories

Low-voltage voice, data, communications & biomed systems NURSE CALL is now regulated!

(Code does not say chapter is not retroactive, so many inspectors may apply it to existing)



### NFPA 99 – CHAPTER 7 INFO TECHNOLOGY SYSTEMS



### NFPA 99 – CHAPTER 7 INFO TECHNOLOGY SYSTEMS



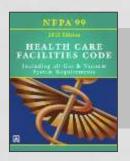
7.3.2 – <u>Systems</u> No requirements (reserved for future code development)

### 7.3.1 – <u>Infrastructure</u>

- Building Entrance
- Data Center
- Telecom Equip Rm
- Power Requirements
- Pathways

- Patient Call
  - Emergency Call
  - Staff Assist Call
  - Emergency Resuscitation
  - (many other sys reserved for future code development)

# NFPA 99 – <u>CHAPTER 8</u> PLUMBING SYSTEMS



### <u>NEW</u>Chapter (very short)

- Potable Water
- Nonpotable Water
- Special Use Water
- Grease Interceptors
- Black Waste Water
- Gray Waste Water
- Clear Waste Water
- Fuel



- Non-med Compressed Air
- Water Conditioning
- Water Heating

### (not retroactive)

### NFPA 99 – CHAPTER 8 PLUMBING SYSTEMS



8.2 For each plumbing component system, the facility must designate risk category for each building space.

8.2.1 The risk category of each plumbing system shall be independent of the category applied to other systems that serve the same space.

### NFPA 99 – CHAPTER 8 PLUMBING SYSTEMS

Sample Table

Function	Potable	Nonpotable	Special Use	Water Conditioning	Water Heating	Process Air	Fuel
Airborne infection isolation room	2	NA	NA	NA	3	NA	NA
Burn patient care rooms	2	NA	NA	NA	3	NA	NA
Business offices/administration	4	4	4	4	4	4	4
Central sterile room	2	NA	NA	NA	3	2	NA
Class A surgical procedures	2	NA	NA	NA	3	NA	NA
Class B surgical procedures	2	NA	NA	NA	3	NA	NA
Class C surgical procedures	2	NA	NA	NA	3	NA	NA
Critical care rooms (Category 1 room)	2	NA	NA	NA	3	NA	NA
Emergency department trauma room	2	NA	NA	NA	3	NA	NA
Hemodialysis	2	NA	2	NA	3	NA	NA
Intensive care	2	NA	NA	NA	3	NA	NA
Medical records	4	4	4	4	4	4	4
Morgue	2	NA '	NA	NA	3	NA	NA
PACU	2	NA	NA	NA	3	NA	NA
Patient education	4	4	4	4	4	41111	4
Pharmacy	2	NA	NA	NA	3	NA	NA
Protective environment room	2	NA	NA	NA	3	NA	NA
Radiology	2	NA	NA	NA	3	NA	NA
Speech therapy	4	4	4	4	4	4	4
Waiting rooms	4	4	4	4	4	4	4

NA: Not applicable

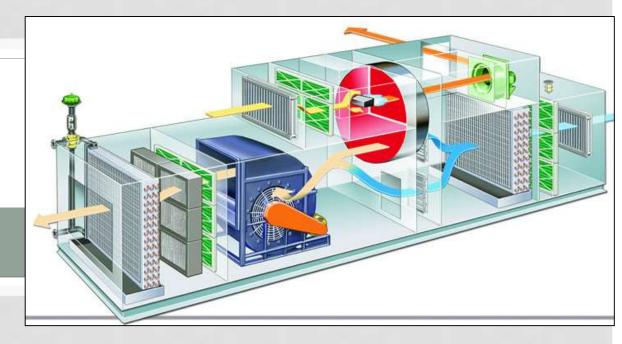
Note: This is a sample table. The numbers represented in this table might not be consistent with the health care facility scenario.

7

# NFPA 99 – <u>CHAPTER 9</u> HVAC SYSTEMS

### **<u>NEW</u>** Chapter (short)

- Heating
- Cooling
- Ventilation
- Process



### (not retroactive)

### NFPA 99 – CHAPTER 9 HVAC SYSTEMS



9.2 For each HVAC component system, the facility must designate risk category for each building space.

9.2.1 The risk category of each HVAC system shall be independent of the category applied to other systems that serve the same space.

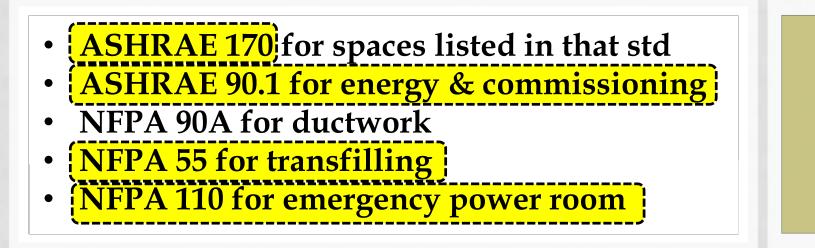
Function	Heating	Cooling	Ventilating	Process
Airborne infection isolation room	2	2	2	NA
Ambulance garage	NA	NA	3	NA
Biomedical waste holding	2	3	2	2
Bone marrow transplants	2	2	1	NA
Burn patient care rooms	2	2	2	NA
Business office/administration	4	4	4	4
Central sterile room	3	2	2	2
Class A surgical procedures	3	3	2	3
Class B surgical procedures	2	2	2	2
Class C surgical procedures	1	1	1	1
Critical care rooms (Category 1 room)	2	2	2	2
Emergency department trauma room	2	2	2	2
Intensive care	2	2	2	2
Medical-gas storage room	2	2	2	NA
Medical records	4	4	4	4
Morgue	3	3	2	NA
Occupation therapy	4	4	4	4
Oxygen transfilling	2	2	2	NA
PACU	2	2	2	2
Patient education	4	4	4	4
Pharmacy	2	2	2	2
Physical therapy	4	4	4	4
Protective environment room	2	2	2	NA
Radiology	2	2	2	2
Speech therapy	4	4	4	4
Waiting rooms	4	4	4	4

### Sample Table

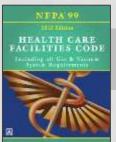
SYSTEMS NFPA 99 CH 9 HVAC

### NFPA 99 – CHAPTER 9 HVAC SYSTEMS

### **ADOPTED BY REFERENCE**



# NFPA 99 – <u>CHAPTER 10</u> ELECTRICAL EQUIPMENT



## Not organized by Risk Categories

Similar to 1999 standard

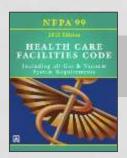
### **Primarily on <b>TESTING**

- Patient-Care related equip
- Non-Patient equipment
- Laboratory equipment

(retroactive)



# NFPA 99 – <u>CHAPTER 11</u> GAS EQUIPMENT



## Not organized by Risk Categories

Similar to 1999 standard

- Cylinder Requirements
- Cylinder Storage
- Gas Equipment Testing
- Transfilling & Liquid Oxygen
- Testing Requirements

### (retroactive)



# NFPA 99 RISK ASSESSMENTS

# ARE YOU READY ?

(Get started now)

### NFPA'99

**2012 Edition** 

### HEALTH CARE FACILITIES CODE

Including all Gas & Vacuum System Requirements





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## NFPA 99 RISK ASSESSMENTS





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