

WISCONSIN HEALTHCARE ENGINEERING ASSOCIATION Dedicated to Excellence in Healtbcare Engineering

### **EMERGENCY GENERATORS**

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WISCONSIN HEALTHCARE ENGINEERING ASSOCIATION

Dedicated to Excellence in Healtbcare Engineering

#### YOUR PRESENTERS:



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

#### Heather Lauzon Werner

- Experienced Life Safety Inspector
- Current Director of Environment of Care
   Lakeview Specialty Hospital & CBRF
- Experienced with CMS, Joint Commission & CARF Surveys





#### WISCONSIN HEALTHCARE ENGINEERING ASSOCIATION

Dedicated to Excellence in Healtbcare Engineering



2011-present Lauzon Life Safety Consulting, LLC Statewide Consultant



<u>1973-2006</u> "Facility Engineer" Tomah – Fargo- Madison Kenosha - Ra<mark>cine</mark>



# EMERGENCY GENERATORS



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"Low three knich & kom topics & format - much easier to make happen for our staff, as we dan't have to travel or get individual \$3.\*

> "The programs are all eye openers and good for the brain."

"Thinks for creating the program sector. It is very educational."

> "Because it was a webinar and we were able to have our whole staff attend

"Website's serve out company time and money. Thank you:"

T nes greit en a webieur in our facility so all ny stalf wire

able to attend."



The WHEA's Educational and Professional Development (EPD) Committee is offering 12 webinars for the 2015 calendar year for a one time, low price per computer connection.\*

> S500 Regular Registration (\$42 per webinar) \$300 WHEA Member Discount (\$25 per webinar)

#### NO LODGING NO OVERTIME ONE TIME PAYMENT

This is a cost effective, professional development series for facility staff, administrators and contractors. This is a fantastic opportunity to stay up to date on current issues without leaving your facility. You will receive complete session information approximately 2 weeks before each webinar.

Each webinar offers 1.5 Contact Hours/15 CEUs approved by ASHE.

Registration is now open at www.whea.com for this 2015 webinar series. Follow the drop downs under the Education tab to "Webinar Series Registration".

To receive the members only discounted rate <u>you must log into the WHEA members</u> only site and use the Members Only registration form. If you don't have a members only login, email Arwork/*izebsglobal com* and set up your members only access

You may sign up anytime during the year but the cost will stay the same - there is no individual webinar pricing. All webinars will be recorded and you will receive a link to that recording after the webinar has been presented. Even if you are not able to attend, you can still have these important updates to watch at your convenience.

#### 2015 WEBINAR TOPICS: Additional Topics In Process:

January 8 - Generator Testing and Maintenance February 12 - Life Safety Plan-Definitions, (walls, etc.) March 12 - Waste Streams (pharmaceutical, red bag)

Additional Webinar Datas: April 9, May 14, June 11, July 9, August 13, September 10, October 8, November 12, and December 10. ICRA/ILSM 
 •Risk Assessments NFPA 99
 •Fire Damper Testing/Maintenance
 Energy Conservation Measures-Lighting
 •Electrical Testing & Maintenance
 •Mold Prevention and Remediation
 New Construction Commissioning
 OSHW/Safety Topics 2012 LSC Update
 •Recordkeeping 
 •Fire Drifts 
 •Humidification







WISCONSIN HEALTHCARE ENGINEERING ASSOCIATION

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#### **TENTATIVE 2015 LUNCH & LEARN CALENDAR**





WISCONSIN HEALTHCARE ENGINEERING ASSOCIATION

Dedicated to Excellence in Healtbcare Engineering

#### **TENTATIVE 2015 LUNCH & LEARN CALENDAR**



# EMERGENCY GENERATORS

#### Agenda

- 1. <u>REGULATIONS (NFPA 101, 99, 110; TJC, NEC)</u>
- 2. <u>COMPLIANCE CONFUSIONS</u>
- 3. **INSTALLATION** requirements
- 4. **INSPECTIONS** requirements



### EMERGENCY GENERATORS

#### Agenda

- 1. REGULATIONS (NFPA 101, 99, 110; TJC, NEC)
- 2. COMPLIANCE CONFUSIONS
- 3. INSTALLATION requirements
- 4. INSPECTIONS



# 3 Big AHJs follow the same Code

(but different editions)





3 Big AHJs















110

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#### At least 10 Locations



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<u>18.2.9.2:</u> "Buildings equipped with or in which patients require the use of life-support systems shall have <u>EMERGENCY LIGHTING</u>

equipment supplied by the life safety branch of the electrical system as described in NFPA 99"

This wording in NOT in Chapter 19



<u>7.9.2.3:</u> "Emergency generators providing power to <u>EMERGENCY LIGHTING</u> systems shall be installed , tested, and maintained in accordance with NFPA 110"

(ALSO applies to Existing Health Care)



<u>18.2.10.2:</u> "Buildings equipped with or in which patients require the use of life-support systems shall have ILLUMINATION OF THE **REQUIRED EXIT AND** DIRECTIONAL SIGNS supplied by the life safety branch of the electrical system as described in NFPA **99**" This wording in NOT in Chapter 19



<u>18.5.1.2:</u> "Power for <u>ALARMS</u>, emergency communication systems, and illumination of generator set locations shall be in accordance with the essential electrical system requirements of NFPA 99"

This wording in NOT in Chapter 19



<u>18.5.1.3:</u> "Any health care occupancy...that normally uses <u>LIFE-SUPPORT</u> <u>DEVICES</u> shall have electrical systems designed and installed in accordance with NFPA 99" (Exception: "Not apply to a facility that

uses life-support equipment for emergency purposes only)

This wording in NOT in Chapter 19



#### 3-4.1.1: GENERATOR SET

- One or more alternative sources for use when the normal source is interrupted"
- On-Site
- Under the Control
- Comply with NFPA 110
- Exclusive Use
- 10 Sec Transfer
- Safety Devices & Annunciators
- ATS Features



#### 3-4.4.1.1: GENERATOR MAINT.

 Maintenance shall be performed in accordance with NFPA 110



<u>3-5.1: TYPE 2 EES (Nursing H)</u> "The requirements for sources for Type 2 essential electrical systems shall confirm to those listed in 3-4.1"



3-6.1: TYPE 3 EES (Ambulatory) "Generators shall confirm to 3-4.1.1"



<u>NFPA 110</u>: *Emergency* & Standby Power Systems

- 3 Generator Requirements
- 4 Switching Requirements
- 5 Install Requirements
- 6 Test Requirements

Apply to Existing HC via LSC 7.9.2.3

CALS CENTERS for MEDICARE & MEDICAID SERVICES



#### **CATEGORICAL WAIVERS**

- 1. Unoccupied Stair Openings
- 2. Door Locking
- 3. Delayed Egress Locking
- 4. Suite Size & TD
- 5. Sprinkler Testing
- 6. Fire Pump Testing
- 7. OR Humidity
- 8. Fireplaces-Direct Vent

- 9. Fireplaces-Solid Fuel
- **10. Corridor Kitchens**
- **11. Corridor Obstruction**
- **12. Combustible Decorations**
- 13. Waste Container Size
- 14. Med Gas Alarms
- 15. GENERATOR LOAD BANKING
- 16. Strip Plugs



#### **CATEGORICAL WAIVER**

CENTERS for MEDICARE & MEDICAID SERVICES

							CMS CATEGORICAL W	AIVER CHEC	KLIST		Page 4 o
WAIVER TOPIC	K-TAG	TJC STD	S&C Letter	S&C DATE	CODE REF	CURRENT CODE REQUIREMENT	NEW CODE SUMMARY	CODE REF	REQUIREMENTS THAT MUST (ALL appli show satisfa	BE COMPLIED WITH TO USE THE cable items must be checked & ha ctory compliance; refer to full code	CATEGORICAL WAIVER (i.e., 2012 CODE) ve documentation to e to ensure compliance)
12-Decoration, Combustible	K-073	LS02.01.70 EP 1	12-21 13-58	3/9/12 8/30/13	101-00 §18/19.7.5	no combustible decorations	increased wall space covered with combustible decorations	101-2012 §18/19.7.5.6	□Flame-Retardant or Fire- retardant treated listed for material □ or Meet NFPA 701 □ or Heat Release 100KW or less per NFPA 289 with 20 Kw ignition source	Art, photos, paintings on walls: Not interfere with door latching Not exceed max % of celling, wall & door areas: (see next colum)	Max 20% surface area in non-sprinkled space     Max 30% surface area in fully sprinkled smoke compartment     Max 50% surface area of pt room in fully sprinkled smoke compart.
13-Waste Container sizes	K-075	LSO2.01.70 EP 2	13-58	8/30/13	101-2000 §18/19.7.5.7	max 32 gal container outside of haz storage when not attended	recycling containers for clean waste may be up to 96 gal	101-2012 §18/19.7.5.7.2	Containers used solely for recycling clean waste or patient records waiting for destruction	Max 96 gal capacity outside of hazardous room     No limit on size if stored in hazardous room when not attended	Containers for combustibles shall be labeled to satisfy FM 6921 or equal
□ 14-Med Gas Master Alarm	K-140	EC02.05.01 EP 1	13-58	8/30/13	99-1999 §4-3.1.2.2	master alarms must be provided in two separate locations and does not permit use of central computer monitoring in lieu of a panel	central computer monitoring may be substituted for one of the required med gas master alarms	99-2012 §5.1.9.4	Computer Sys: Be in continuous uninterrupted operation q Powered to ensure reliability Be continuously attended by a responsible person or Remotely signal responsible parities via pager, auto-dialer, etc. Interface devices supervised to alarm any failure Signal switch/sensors must be powered by the computer sys or by Life Safety ATS	<ul> <li>□ Computer communicates directly with signal switch/ sensors &amp; comply with same 10 requirements as med gas panels □ Computer connections with signal switch/sensors are supervised so failure generates alarm</li> <li>□ Audio alert loud enough to inform system operator</li> <li>□ Communication devices do not use elec wiring for signals</li> <li>□ Transmission is supervised so failures initiate an alarm</li> </ul>	Computer Program: Med Gas alarm must have Life Safety priority signal Med Gas alarm must interrupt all lower priority alarms Program includes audible alert, remote signaling, display of specific alarm condition Must separately display each condition monitored, remain in alarm until problem resolved, be cancelable, visual/audible alarm if communication with any device is disrupted; reinitiate alarm signals even if audible is silenced during prior alarm
15-Generator Load Bank Exercising	K-144	EC02.05.07 EP 5	13-58	8/30/13	110-1999 §6-4.2.2	diesel generators may use the 2-hr load bank exercise in lieu of the monthly 30% loading	diesel generators may use a 1- 1/2 hrs load bank exercise in lleu of the monthly 30% loading	110-2010 §8.4.2.3	Applies to Diesel only     Run monthly at avail load	Annual Load bank for min 1- 1/2 hr, and:  @Min 50% load for 30 min  @Min 75% load for 60 min	

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# 2012 Adoption Impact on GENERATORS



### 2012 Adoption Impact on GENERATORS



#### In At least 10 Locations





HEALTH CARE CODE Chapter 6 – Electrical

<u>Section 6.4.3—Performance Criteria &</u> <u>Testing</u> Covers EES Type 1 performance criteria to assure that the EES is safe and reliable. <u>Includes:</u>

- Maintenance, inspection and testing of the EES alternate power source, including generator testing criteria, test conditions, and testing personnel qualifications
- Specific maintenance, inspection and testing requirements are also required through reference to <u>NFPA 110</u>, Standard for Emergency and Standby Power Systems
- Maintenance & testing of <u>EES circuitry</u>
- <u>Record keeping</u> requirements.



### Biggest Question: <u>WHEN</u> will

#### The 2012 LSC be effective?

If the Past is any Indic	cation:	Projec	cted
<u>Steps</u> 2000	LSC Adoption	2012 LSC	Adoption
1. Proposed Rule	Oct, 2001		Apr 2014
2. Final Rule Action	Nov, 2002	(+13 mo)	May 2015
3. S&C Adopt Ltr	Jan, 2003	(+2 mo)	Jul 2015
4. Effective Date	Mar, 2003	(+2 mo)	<u>Sep 2015</u>
5. Survey Start	Sep, 2003	(+6 mo)	Mar 2016



AHJs



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### Agenda

- **1. REGULATIONS** (NFPA 101, 99, 110; TJC, NEC)
- 2. <u>COMPLIANCE CONFUSIONS</u>
- 3. INSTALLATION requirements
- 4. INSPECTIONS requirements

### **Often Confused Conditions**



### **1-NEW vs EXISTING**

The Life Safety Code () safety features must be Therefore, existing facil (2000) for existing heal under method must have LSC Editi Comply with Code in effe	CONSTRU SC) assume that facilities "continuously maintained" (I lities must comply with the m thcare (see below). For simpli e the appropriate codes fully on 2000 (New)	JCTION REC Use constructor in compliant LSC 4.6.12) to retain there a sore restrictive requirements (city, CMS typically defaults referenced. 2000 (Existing)	UIREMENT bility to be effective. of (a) the LSC for new heal s to the 2000 Existin	TS OF PAST ED	ITIONS OF LS Total the time of construction in the year the facility was built neers take the afore mentioned a 1967 (New)	C (1 SC 1 6 0.1). All required life or remodeled, or (b) the LSC oproach and deficiencies cited 1967 (Existing)		
DQA: Likes to enforce the								
NEW CONSTRUCTION CODE THAT WAS IN EFFECT								
when the facility was built or remodeled								
Dead I (also A						be 85)		
Dead I (also A Hazaro <u>OR</u> Spe		F	RATHER	THAN		be 35) hens. r, gift		
Dead I (also A Hazaro <u>OR Spi</u> Hazaro <u>AND</u> S		F the exist	RATHER	THAN e (chapter	19)	be 35) hens. r, gift		
Dead I (also A Hazaro <u>OR</u> Spi Hazaro <u>AND</u> S Smoke Barrier Walls	1-hr (18.3.7.3)	F the exist	RATHER ting code	THAN e (chapter	<b>19)</b>	be 35) hens. r, gift 30 Min (10-2313)		
Dead I (also A Hazaro <u>OR Spr</u> Hazaro <u>AND S</u> Smoke Barrier Walls Smoke Barrier Doors	1-hr (18.3.7.3) solid Core or 20 min label (18.3.7); Vision Panels (18.3.7.7)	F the exist 30 Min (19.3.7.3) Solid Core-	RATHER ting code	THAN e (chapter <sup>1-hr(12-3.73)</sup> does not	<b>19)</b> 1-hr (10-1314) no label (6-6111); anels (10-1317)	be 35) hens. r, gift 30 Min (10-2313) Solid Core-no label (10-2313)		
Dead I (also A Hazard OR Spi Hazard AND S Smoke Barrier Walls Smoke Barrier Doors Vertical Opening Wall Rating	1-hr (18.3.7.3) solid Core or 20 min label (18.3.7); Vision Panels (18.3.7.7) 2-hr if 4 or more; 1-hr if 3 or less (18.3.1.1 & 8.2.3.2.3.1)	F the exist 30 Min (19.3.7.3) Solid Core- 1-H	ATHER ting code Intr(12-3.73) • TJC co • CMS co	THAN e (chapter <sup>1-hr (12-3.73)</sup> does not does not	1-hr (10-1314) no label (6-6111); anels (10-1317) nore stories in non- other 1-hr (10-1341; 5-1114)	be 35) hens. r, gift 30 Min (10-2313) Solid Core-no label (10-2313) 1-hr (10-2322)		

#### 2 – <u>FUEL SOURCE</u>

- On-Site Storage (Diesel) vs Reliable Service (NG)
- 30% Exception for Diesel only



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DIESEL OIL

3 – <u>CODE EDITION</u>

- 2000 LSC vs newer editions
- NFPA 110 1999 edition vs 2005 edition (TJC)
- NFPA 70 (NEC) 2011, 2008, 2005 by Wis



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#### 4 – <u>LEVEL vs TYPE</u>

- NFPA 110 <u>LEVEL</u> = Stringency of Performance
  - 1 Failure has serious life consequences
  - 2 Failure less critical
- NFPA 99 <u>TYPE</u> = Kind of Essential Elect Sys
  - 1 Life Support
  - 2 No Life Support
  - 3 Ambulatory

### **Often Confused Conditions**







### Agenda

- 1. REGULATIONS (NFPA 101, 99, 110; TJC, NEC)
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#### MFPA 110 Standard for Emergency and Standy Power Systems 1999 Edition

## GENERATOR INSTALLATION

**<u>110</u>**: Emergency & Standby Power Systems

#### **Chapters:**

- 3 Generator Requirements
- 4 Switching Requirements
- 5 Install Requirements
- 6 Test Requirements

Apply to Existing HC via LSC 7.9.2.3



### NATURAL GAS FUEL SOURCE

### CMS Region 5 Release (5/29/2009)

"If a facility uses a natural gas generator to provide backup power to LSC required systems (i.e., emergency lights, exit lights, fire alarm system, etc.), the facility may obtain a letter from its natural gas vendor to demonstrate the fuel source is reliable and to meet the requirements for an on-site backup power source.

The <u>letter of reliability</u> from the vendor regarding the fuel supply must contain all of the following:

- 1. A statement of <u>reasonable reliability</u> of the natural gas delivery
- 2. A brief description that <u>supports</u> the statement regarding the reliability
- 3. A statement that there is a <u>low probability of interruption</u> of the natural gas
- 4. A brief description that <u>supports</u> the statement regarding the low probability of interruption
- 5. The signature of <u>technical</u> personnel from the natural gas vendor "

#### **SAMPLE Natural Gas Provider Letter**

Alliant Energy-Wisconsin I Rehabilitation with natural gas and	Power and Light Co supplies . electricity. This delivered energy may be considered
reliable assuming the bills are paid unforeseen natural disasters, weath	by you on a timely basis and that there are no or or facility related disruptions, or planned
/ maintenance outages. If you need 920-322-6635.	any further clarification, please feel free to call me at
Sincerely,	
	NG Reliability Letter: per §3-1.1 exception; and NFPA 99-1999 Handbook,
Alliant Energy-Wisconstr Power	§3-4.1.1.13 (for ahj eval of low probability); and CMS Region V Letter of May
	1). Normally Reliable; 2).w/Evidence;
54	3).Co <del>w Interruption 4). w/</del> Evidence; 5).Tech Sig

#### **SAMPLE Natural Gas Provider Letter**

Subject: Natural gas service reliability at

#### Dear

Thank you for contacting We Energies regarding our natural gas system reliability to supply for stand-by generation system operation at your facility.

The natural gas service we provide has been, and continues to be, reliable in the areas we serve. Occasionally, construction dig-ins or other situations occur and can affect small portions of our distribution system for a limited time. However, on an annual basis, natural gas service has historically been maintained 99.9 percent of the time to our customers.

If we need to schedule required maintenance that may affect your natural gas service, we notify you in advance and try to make arrangements to accommodate your specific needs.

We look forward to continuing to provide you with reliable and safe natural gas service.

If you have additional questions, please contact me at 414-385-6143.

Sincerely,



NG Reliability Letter: per §3-1.1 exception; and NFPA 99-1999 Handbook, §3-4.1.1.13 (for ahj eval of low probability); and CMS Region V Letter of May 29, 2009 1). Normally Reliable; 2).w/Evidence; 3).Low Interruption 4). w/Evidence; 5).Tech Sig



## GENERATOR INSTALLATION 110: EMERGENCY & STANDBY POWER SYSTEMS 3-5.5 – CONTROL FUNCTIONS: Control panel shall have: Auto remote start capability **Run-Off-Auto switch** Shutdowns Alarms Controls

Remote Stop switch



## GENERATOR INSTALLATION

### 110: EMERGENCY & STANDBY POWER SYSTEMS

#### 5-2 – EPS LOCATION:

- Separate room (level 1), 2-hr enclosure
- EPSS not in room with normal power
- Minimize flood potential



#### <u>5-3 – EPS LIGHTING</u>

Battery powered emergency lite



## GENERATOR INSTALLATION

### 110: EMERGENCY & STANDBY POWER SYSTEMS

#### 5-13 – ACCEPTANCE:

- Full load test for 2 hrs
- Cycle Crank test
- Documentation to AHJ



### Agenda

- 1. REGULATIONS (NFPA 101, 99, 110; TJC, NEC)
- 2. COMPLIANCE CONFUSIONS
- 3. INSTALLATION requirements

### 4. INSPECTIONS

### 110: EMERGENCY & STANDBY POWER SYSTEMS

6-1.1: "The routine maintenance and operational testing program shall be based on the <u>MANUFACTURER'S</u> <u>RECOMMENDATIONS</u>, instruction manuals, and the minimum requirements of this chapter and the authority having jurisdiction."

> Usually not a Document Review issue because most use a mfgr rep for annual maintenance.







# ALL Inspection documents **must** show:

- 1. <u>WHO</u> did the inspection? (have documentation of qualifications; if using Initials, a conversion to names)
- 2. WHAT was inspected? (If multiple devices, list each one w/location)
- 3. WHEN was the inspection performed?
- 4. <u>HOW</u> was the inspection performed? (describe method used & criteria for pass/fail)
- 5. **DEFICIENCIES** were corrected? (Document Who, What, When of correction)

<u>CMS:</u> Instructions to Surveyors Joint Commission: EC.02.03.05, EP25

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#### Zero in on GENERATOR INSPECTIONS

FREQ.	DOCUMENT MUST CONTAIN: (in addition to the above)
Weekly	VISUALS: per <u>§6-4.1</u> ; and <u>§A6-3.1(a)</u> for recommended items 1).Generator General Sys
K144w	<ul> <li>2).Fuel Level, Float Switches, Hoses</li> <li>3).Lube Oil Level, Lube oil heater operation</li> <li>4).Coolant Level; Radiator Cleanliness; Water Pump, Hoses</li> <li>5).Exhaust Sys</li> <li>6).Battery Electrolyte Levels</li> <li>7).Elec Sys General Inspection</li> <li>8).Housekeeping</li> </ul>

Generate Signation of the Second Science of	or Inspection – WEEKLY All Documents must show <u>WHO</u> did inpsection & they're qualified; <u>WHAT</u> was inspected (list each device); <u>WHEN</u> tested; <u>HOW</u> (method of test & criteria for "pass/fail"). Deficiencies MUST show as corrected w/WWWH info
Date Test / Power Failure Engine: Hoses & Belts (Pass, Fail) Oil Level. (OK, Add) Air Cleaner, (Pass, Fail) Engine Heater, (Pass, Fail) Radiator Clean, (Pass, Fail) Coolant Level, (Pass, Add) Oil Pressure (PSI) Water Temperature	<ul> <li>1).Generator General Sys</li> <li>2).Fuel Level, Float Switches, Hoses X</li> <li>3).Lube Oil Level, Lube oil heater operation X</li> <li>4).Coolant Level; Radiator Cleanliness; Water Pump, Hoses X</li> <li>5).Exhaust Sys X</li> <li>6).Battery Electrolyte Levels X</li> <li>7).Elec Sys General Inspection X</li> <li>8).Housekeeping X</li> </ul>
Presence of Leaks, (Pass, Fail) Battery Terminal Conditions, (pass, Fail) Water Level, (OK, Add) Battery Charge rate, (Volts)	Compare the FORM Against REQUIREMENTS (left) (right)



ADE	Q		<b>A</b> '	TE	<b>m</b> E 7					All Documents must show <u>WHO</u> did inpsection & they're qualified; <u>WHAT</u> was inspected (list each device); <u>WHEN</u> ter <u>HOW</u> (method of test & criteria for "pass/fail"). Deficiencies MUST show as corrected w/WWWH info <u>VISUALS</u> : per <u>§6-4.1</u> ; and <u>§A6-3.1(a)</u> for recommended items 1). Generator General Sys <b>X</b>		
Month Year	Ger	nerator	Inspec	tion and	d Testi	ing Recor	ď			<ol> <li>2). Fuel Level, Float Switches, Hoses</li> <li>3). Lube Oil Level, Lube oil heater operation</li> <li>4). Coolant Level, Radiator Cleanliness; Wate Cump, Hoses</li> <li>5). Exhaust System 200</li> </ol>		
	1 147	est 1	Week	ly Inspe	ction	laak2	1.4	look A		6) Battery Electrolyte Levels		
	OK	Not OK	OK	Not OK	OK	Not OK	OK	Not OK	N/A	7) Elec Sys Concern Linspection X		
Check Engine Fuel Level		HOLOK			-							
Check Engine oil Level										a). Housekeeping		
Check Batteries				10.00								
Check Coolant fluid level												
Check Air Filter												
Visual Check of Belts and Hoses	11.2	1864										
Date of Inspection												
Indicate corrective measures of items marked Not OK				5	~							
NOTOK					$\sim$			mna	ro			
						$\overline{}$	00	mpa				
							the	<b>FOF</b>	RM	Against REQUIREMENTS		
										Against REGOILEMENTS		
								(left)		(right)		

#### **Generator Inspection - WEEKLY**

I	Emergency	Generator Te	st Record		All Documents must show <u>WHO</u> did inpsection & they're qualified; <u>WHAT</u> was inspected (list each device); <u>WHEN</u> tested; <u>HOW</u> (method of test & criteria for "passifail"). Deficiencies MUST show as corrected w/WWWH info		
Date	Unit Hours	لايمىڭ مەن يۈرۈزكە - ئۇرى - ئارىمۇرلار - ئۇرۇ - ئەرىمە - ئىرىم	Unit Hours		VISUALS: per §6-4.1; and §A6-3.1(a) for recommended items		
	(time start	)	(time stop _		1).Generator General Sys 2) Euel Level Float Switches Hoses		
Weekly Inspections				2	3 <mark>).Lube Oil Level</mark> , Lube oil heater operation		
Control panel display show	s no faults	Generator b	reaker is closed	(up)	4).Coolant Level; Radiator Cleanliness; Water Pump, Hoses		
"System Ready" light is illu	iminated	Air filter ho	using has no ob	structions _	5).Exhaust Sys 🗙		
Push white button for Lam	o Test	Engine belt	s and hose visua	l check	6).Battery Electrolyte Levels		
No signs of damage or rode	nt nesting	Oil level is	at "full"	-	7).Elec Sys General Inspection		
Battery leads have no corro	sion	Fuel level	F••••3/4•••	•1/2••••1/4	8).Housekeeping		
Radiator fins has no obstrue	ctions	Battery elec	trolyte level pro	per			
Inspect fuel piping and filte	rs for leaks	Coolant lev	el is up to neck	_			
No indication of coolant or	oil leaks	_ (make sur	e upper hose is i	not pressuriz	zed)		
Jacket Water Heater operation	ional	-					
Monthly: Battery specific	gravity	Battery term	ninals clean and	l tight	5 This Form		
Weekly Unloaded Engine Place the control switch in t	Run the run position.	Fifteen (15) minute	s after starting, 1	record the fo	ADEQUATE?		
Oil Pressure	psi Water	Temp.	Battery Char	ge	olts		
72							
Month & Yr:			Refer to Inspection	Methods Sheet for	instructions on perfo	rming checks	Recommended
----------------------------	--------	-----------	---------------------	-------------------	-----------------------	--	--
Generator ID:			Gen KW:		Gen Amps:		
Generator Loc:			Gen Volt:				
			Week 1	Week 2	Week 3	Week 4	
Date of	finspe	ection:					
Who	Perfo	med:					
	VISUAL	TEST	EN	TER RESULTS	OF INSPECTIC	ONS (OK=Satisfac	Eorm
GENERATOR ROOM				r	1	1 1	ГОПП
Housekeeping	X						
Signs of Rodents	X						
Instruction Manuals	X			-		+	PDF Available for FREE at:
Intake Grill Filter	×			-	-		
FUEL-OIL SYSTEM	^			1	1	<u> </u>	VVebsite: Lauzon-LSC.com
Hose & Connectors	×		1	1	1		
Leaks	x			-			
Main Supply Tank Level	x			#			Cada Cantral Mambara
Day Tank Level (Record)	x		#	#	#	#	Code Central Members can
Day Tank Float Switch	x	x			-		download the event version
Transfer Pump Operation	x	X		-			
Air Filter	x	x					that is aditable
Water in System	х						
LUBRICATION SYSTEM		10 - 10 S	9	20	a.		
Oil Level (Record)	x		#	8	#		
Leaks	х					All Documents must show	(WHO did intrsection & they're qualified: WHAT was inspected (list each device): WHEN test
Oil or Block Heater	х	X		1	2		
COOLING SYSTEM		x	-		2A	HOW (method c	of test & criteria for "passifail") Deficiencies MUST show as corrected wMMMH info
Water Level (Record)	x		#	#	#	BURGLER AND A CONTRACT OF A CO	
Fresh Air Thru Radiator	X						
Water Pump & Belts	X			-	-	VISUALS per S	<u>20-4.1</u> , and <u>SA0-3.1(a)</u> for recommended items
Hose & Connectors	×			-		1) Congrator Co	noral Sve
Leaks	X					1). Generator Ge	ineral bys
Jacket water Heater	×					2) FUEL EVAL FL	nat Switches Hoses
EAHAUST STSTEM	~	1	-	T		2).1 001 20101, 1 1	001 OW10103, 110303
Drain Condensate Tran	~				-	3) Lube Oil Leve	Lube oil heater operation
BATTERY SYSTEM	~				-		
Battery Charger Sue	Y		1	1		4).Coolant Level	Radiator Cleanliness: Water Pump. Hoses
Battery Charge Bate	x			2			h an
Terminal Corrosion	×				1	5). Exhaust Sys	
Electrolyte Level	x					0 0-4- 5-	
ELECTRICAL SYSTEM	- 12-1	<u>.</u>				b).Battery Electro	olyte Levels
General Inspection	x					7) Elas Sus Can	aral increation
EPSS Sys Condition	x					r). Elecisys Gen	erarmspection
Service Rm/Housing	x					8) Housekooning	N
Display Panel Lights/Mater	x	X		1		U). HUUSEKEEDIII	g+++++++++++++++++++++++++++++++++++++



# GENERATOR INSPECTIONS

# 110: EMERGENCY & STANDBY POWER SYSTEMS

## 6-4.4 – <u>Time Delays</u>

- Min 5 min restore to normal
- Min 5 min shut-down



Exercise w/Cold Start Testing: per §6-4.2 thru §6-4-4

Test intervals can be 20 to 40 days apart, per NFPA 99(1999), §3-4.4.1.1

1). Duration Minimum 30 Min under load + minimum 5 min cool-down;

2). Load>30% of nameplate, or minimum Mfr Exh GasTemp;

DATE	TIME	RESI	JLTS	INITIA OF PERS MAKING T	ALS SON TEST	
8-10-98	7:33	under	Со	mpare		The Code
8-18-98	0130	66	the	FORM	Agains	
8-26	1:000	DY		left)		(right)
9-4-98	10:00	M		AK		
5-9-97	8:00	Kok	Andertool	Att		
9-17-90	7.05	Oh	-	Shows	the Who a	When but not any of
Q-23-98	9:10	ou	-	the DE	TAILS of t	he Exercising
9-28-98	10:30	Ch		20		
10-5-98	9:14	Under	1 cabox	Ser		
10-13-5	810:00	OK		55		
in palit	A'(1)	ak		H		

All Documents must show <u>WHO</u> did inpsection & they're qualified; <u>WHAT</u> was inspected (list each device); <u>WHEN</u> tested; <u>HOW</u> (method of test & criteria for "pass/fail"). Deficiencies MUST show as corrected w/WWWH info

		ton Time	Oil	Battery	Temo	Amps 1	Amps 2	Amps 3	Volts 1	Volts 2	Volts 3	Tester	Comments
111	2	35	OK.	OK	oK	OK	ok	OK	OK	OK	OK	5P_	OK
	(/)	5	OK	OK	GK	011	OK	OK	OK	oic	OK	SP	OK
	Y	1:35	01	OK	011	ok	OK	OK	OK	OK	NK	SP.	OK
2/22	2:00	7:35	OK	OK	οK	ОК	Oil	бк	OK	GIL	OR	SP	AK
2/1	7:00	7:35	OK	0.K	0.K	0K	OK	6K	OK	OK	OIL	SP SP	<u>0 K</u>
3/8	7'00	7:35	OV	OK	OK	OK	OK	6K	6K	6K	ð K	X	<u>6</u> K
3/15	7:00	7:35	OK	OK	OK	0K_	01	<b>Nhat</b>	does	it ta		SP 12	0K
3/12	7:00	1:35	OK	OK	OK	OK	0	to	'earn	an 'an		517	
3/29	7:6D	7:5	OK	OK	OK	OR	(/		" <b>OK</b> "	?	-	11	C/(
4/5	7:00	7:35	OK	OK	OK	ØK	0K	01	UN	C/C	<b>-</b>	5	<u> </u>





#### Generator

# Satisfactory as a summary sheet, but specific monthly data is required

### **Test of Emergency Generator**

To test the system monthly:

A) Activate the "Test Switch". The "AC Output Voltage" indicator will momentarily dip to zero and then come back to normal voltage (120). This indicates the unit is now on emergency.

B) Release "Test Switch". The "AC Output Voltage" indicator will again dip to zero and return to normal (120). The unit is now on normal power. The "High Charge" indicator should be lit indicating the batteries are now being charged.

#### YEAR

We stand the second states

MONTHLY GENERATOR CHECK Y= Satisfactory N= Unsatisfactory (explain)

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
								1.44	4		





Facility:	Who F	erformed	i i			Date			1	Recommende
Generator Information	Generator IC	E							1	
	Location of Generato	¢ 🗌 👘				#Phases(1 or 3):	3		1	
	Nameplate KiloWattr	e l			kW	Fuel				
Min E	xercise Load (30% x kW	) kW <sub>e</sub> =	6			On-Site Fuel Cap				
	Power Factor	PF=	1			Max Run Duration:	č.			
Names of all ATS	(s) fed by this Generator	5		0132534						
Prior to Start-Up: Check Bell Condition & Tenr	VISUA	TEST	Re	esult of in	spection		Re:	Ealth		Form
Check Battery Posts & Cas	e for Corrosion x	+					Passu	FailQ		
		Cel	1	2 3	4	5 6			1	
Measure Battery Specific Gra	vity in each cell	x					PassQ	FailD		PDF Available for FRFF
Check Battery	Charger & Rate x		-				PassQ	FailD		
Check Battery E	qualize Charge x						Passu	FailD		Website: Lauzon-LSC.
O	Level Reading x						Pass	FailD		
GENERATOR EXERCISE IN	FO NFPA 99, 3-4.4/3-5	4& NFPA	110, 6-3 8 1	64 D	ifference	Pass If:	Ret	sult		
	Date of Test		7			at least 20, but less	Pass	Fail		Code Central Members
	Date of Prior Test		-	2	days	than 40 days	1 035			
Time ATS Test	Button Pushed	A	MPM	- [		at least 30 min	Description of the	F-10		download the excel vers
Time ATS Transfered	Back to Normal	A	MPM		Min	at least 50 mm	Passu	Pair		that is aditable
Time the Gener	ator Shut Down	A	M/PM		Min	at least 5 min		- 202	1	
# Seconds between Push	ing Test & ATS			_		72	Pass	Fail		
Transfer (	Use stopwatch)				Seconda	max 10 sec				
Name of ATS Use	to Start Gen:					rotate ATS used to state				
Operational Checks:	Oil Descence			— E	xercis	se w/Cold	l Star	t Tes	ting:	per §6-4.2 thru §6-4-4
Operational Offects.	Oil Tamo			_	Tech	who wield a		00 +-	40 -	
10.00	Tananating.			-	lesti	ntervais c	an pe	20 10	) 40 a	ays apan, per NFPA 99(1999), <u>93-4</u>
vvate	r Temperature.			1	Dur	ation Mini	mum '	SO MI	n und	er load + minimum 5 min cool down
Ale Interfect and an	a remperature:			')	J. Dur		num		n unu	crieda · minimum o min coordowi
Air intake Louver Op	Curded Op Corro			$-2^{1}$	Loa	d>30% of	name	plate	orm	ninimum Mfr Exh GasTemp
Dedistar Fra	Cycled On/Off?				,		monne	procee	,	
Radiator Fan	the Chevroline 2			HETHOD	é	Gen in Auto Position	at End /			
Radiator Fan Remote Annunciator Indica Generator Load Check	use only one of	THE FOL	LOWING 3	METHOD	3					
Radiator Fan Remote Annunciator Indica Generator Load Check Method #1: 30% of Nameplati	USE ONLY ONE OF	THE FOL	LOWING 3	METHOD	5					
Radiator Fan Remote Annunciator Indica Generator Load Check Method #1: 30% of Nameplate L1 Ampe	USE ONLY <u>ONE</u> OI + KiloWatt (from above) rage (Leg to Leg)	THE FOL	amps	Voltage	(Leg to Leg):	volts				
Radiator Fan Remote Annunciator Indica Generator Load Check Method #1: 30% of Nameplate L1 Ampe L2 Ampe	USE ONLY <u>ONE</u> OI USE ONLY <u>ONE</u> OI S KIIOWatt (from above) rage (Leg to Leg).	THE FOL	amps amps	Voltage	(Leg to Leg): (Leg to Leg):	voita				
Radiator Fan Remote Annunciator Indica Generator Load Check Method #1: 30% of Nameplate L1 Ampe L2 Ampe L3 Ampe	USE ONLY_ONE OF USE ONLY_ONE OF E KiloWatt (from above) rage (Leg to Leg): rage (Leg to Leg): rage (Leg to Leg):	THE FOL	amps amps amps	Voltage Voltage	(Leg to Leg): (Leg to Leg); (Leg to Leg);	voits voits voits				Provening
Radiator Fan Remote Annunciator Indica Generator Load Check Method #1: 30% of Nameplati L1 Ampe L2 Ampe L3 Ampe	INTERPORTATION CONTRACT OF THE	THE FOL	amps amps amps amps	Voltage Voltage Voltage Su	(Leg to Leg): (Leg to Leg): (Leg to Leg): (Leg to Leg): Im of Leos:	vožs vožs vožs				Protection
Radiator Fan Remote Annunciator Indica Generator Load Check Method #1: 30% of Nameplat L1 Ampe L2 Ampe L3 Ampe	ISE OPERATION? USE ONLY_ONE OF F KiloWatt (from above) (rage (Leg to Leg)) rage (Leg to Leg) rage (Leg to Leg) Sum of Legs: Avg of Legs : A=	THE FOL	amps amps amps amps amps amps	Voltage Voltage Voltage Su	(Leg to Leg); (Leg to Leg); (Leg to Leg); m of Legs; g of Legs :	vots vots vots vots vots				Protection
Radiator Fan Remote Annunciator Indice Generator Load Check Method #1: 30% of Nameplati L1 Ampe L2 Ampe L3 Ampe Calculate Exercise L1	INTERPOLATION CONTRACT OF CONT	F x A x	amps amps amps amps amps amps V (substi	Voltage Voltage Voltage Su Av	(Leg to Leg): (Leg to Leg): (Leg to Leg): m of Legs: g of Legs : m above)	vots vots vots V= <u>Pass if</u>	Re	ult		Protection Your Protective Shield in the Code War
Radiator Fan Remote Annunciator Indice Generator Load Check Method #1: 30% of Nameplate L1 Ampe L2 Ampe L3 Ampe Calculate Exercise L0 Calculate Exercise L0	IUSE ONLY_ONE OF USE ONLY_ONE OF E KIIOWatt (from above) rrage (Leg to Leg) rrage (Leg to Leg) sum of Legs: Avg of Legs: Å= >ad; kW = .001732 × F >ad; kW = .kW*	F x A x	amps amps amps amps amps V (substr	Voltage Voltage Voltage Su Av tue # fro	(Leg to Leg): (Leg to Leg): (Leg to Leg): m of Legs: m above) =	vota vota vota V= <u>Pass if</u> kW>=kW <sub>a</sub>	PassD	<u>ult</u> FaitO		Protection Your Protective Shield in the Code War
Radiator Fan Remote Annunciator Indice Generator Load Check Method #1: 30% of Nameplath L1 Ampe L2 Ampe L3 Ampe Calculate Exercise L1 Calculate Exercise L1 Method #2: Min Exhaust Gas T	INTERPOLATION CONTRACT OF CONT	* THE FOL : * × A x !	amps amps amps amps amps V (substr	Voltage Voltage Voltage Su Av tue # fro	(Leg to Leg); (Leg to Leg); (Leg to Leg); m of Legs; g of Legs; m above) ;=	vota vota vota V= <u>Pass if</u> kW >=kW <sub>e</sub> r Mn Exh Gas Temp	Re: PassD	<u>ult</u> Faito		Protection Nour Protective Shield in the Code War

MONTHLY GENERATOR EXER	CISIN	G						N	Gene	100
Facility:	Who P	erformed					Date			_
Generator Information Gene	mator ID:									
Location of G	enerator:						#Phase	os(1 or 3)		
Nameplate K	lloWatts					***		Fuet		
Min Exercise Load (30	756 x kW)	kW,=					Cm-Si	e Fuel Cep		
Pove	r Factor:	PF=			*****	*****	Max R	un Ourston		
Names of all ATS(s) fed by this G	enerator									
Prior to Start-Up:	VISUAL	TEST		Resul	t of Insp	ection			Rei	sut
Check Belt Condition & Tension (tan, pump, at	X (								PassQ	F
Check Battery Posts & Case for Corrosion	<u>×</u>	C	<u> </u>	r	T -	T	<del>.</del>		PassQ	F
Mansure Battery Specific Gravity in each cal		- C-00.		-					PassO	F
Check Battery Chamer & Rate		<u>⊨</u> ^		<b></b>	4		<u></u>		PassO	F
Check Battery Equalize Chem	Ĵ								PassO	F
Oil Loval Pagelor	<u> </u>								Passu	-
GENERATOR EXERCISE INFO DIFA 90.3	4 4 3 5 4	& NEPA	110 6-3	3864	Diff	erence	Pa	ss If:	Rei	sult
	<b></b>			1-	r					
Date of Test	·						at least than	20, but less 40 days	Pass	F
Date of Prior Tes	۱ <u> </u>					dayı	·			
Time ATS Test Button Pushed	<u>ال</u>	A	MPM	D-			at leas	st 30 min	Pass	F
Time ATS Transfered Back to Norma	<u>ا</u>	A	MPM	Π		Ma				
Time the Generator Shut Down	·	Å	MPM	μ		Ma	at lea	st 5 min		
# Seconds between Pushing Test & ATS	3							10	Pass	F
I ransier (Use stopwatch	' <u> </u>					Seconds	i max	10 500	L	
Names of Other ATS electrically transferrer	<u> </u>						AB ATS	s used to sta Exercised	Pass	F
Operational Checks: Oil Pressure									Pass	F.
our resource						p			Peec	
Oil temp							(reorma)		Pase	
vvater Temperature	<b></b>						(feormal		Dane	
Exhaust Temperature							[(Normal		Desett	
Air Intake Louver Opened Property		-				Not but the star and and but b		NE DISK NOW DOOR DOOR DOOR DOOR DO	rasow	
Radiator Fan Cycled On/Off	'								Passu	
Remote Annunciator Indicates Operation?	21					000 000 000 000 000 000 000 0	Gen in A	uto Position	at End?	
Generator Load Check Discover	TOTAL OF	THEFOL	COVAIN	O J ME	mooa					
I Amorano I and I a	n alxove):			1	inon a				1	
La Amportage (Legis Leg			amps	Mal	naño (r	eg in cegi		VUES		
L2 Amperage (Leg to Leg.			ampa	Vo	nade (r	eg to Legi		0083		
L3 Amperage (Leg to Leg)	1		ampa	Vol	nage (r	eg to Leg)		vota		
Sum of Legs			amps		Sum	of Legs		voča		
Avg of Legs	732 v D	Evav	ampa	J	Avg # from	of Legs : above)	Vat 23-	see of	Rea	
Calculate Everying Load, NV - 001	NIAN-	ACC A	. fort	1	MAL -	and vely	L NW	>=kW	Pass	F
Mandara and Alexandra and Alexandra and Alexandra				]						
Manual #2. Min exhaust Gas Temp				<b></b>		Mij 1 -	pr Aven Exh	Care Lemp		-
Actual Exhi	aust Gat	s rempe	mure:					1	<u> </u>	d.

# Recommended MONTHLY Form

PDF Available for FREE at: Website: Lauzon-LSC.com

Code Central Members can download the excel version that is editable



# **TOP PORTION**

MONTHLY GENERATOR	EXERC	ISING	G						Ν	Gene	rator	
acility:	1	Who Pe	rformed					Date				
Senerator Information	Genera	ator ID:										
Lo	cation of Ger	nerator:	#Phases(1)							or 3):		
N	ameplate Kild	Watts:	kW kWe= PF=					,	Fuel:			
Min Exercis	se Load (30%	6 x kW)						On-S	te Fuel Cap:			
	Power	Factor:						Max R	un Duration:			
Names of all ATS(s) fe	d by this Ger	nerator:										
Prior to Start-Up:		VISUAL	TEST		Result	of Insp	pection			Res	ult	
Check Belt Condition & Tension (fi	an, pump, alt)	Х								Pass	FailQ	
Check Battery Posts & Case for	Corrosion	Х						T		Pass	FailO	
			Cell:	1	2	3	4	5	6	Dees	CailO	
Measure Battery Specific Gravity in	n each cell		X					<u> </u>		Passu	Fallu	
Check Battery Char	ger & Rate	Х								Passu	FailU	
Check Battery Equali	ize Charge	х								Pass	FailO	
Oil Leve	el Reading	x								Pass	FailO	

OII LEVEL NEAVING	<u></u>		Criteria f	or Pass
NERATOR EXERCISE INFO NFPA 99, 3-4.4	/3-5.4 & NFPA 110, 6-3 & 6-4	Difference	Pass If:	Result
Date of Test: Date of Prior Test	]]-	days	at least 20, but less than 40 days	Pass Fail
Time ATS Test Button Pushed	AM/PM -	Min	at least 30 min	Pass Fail
Time the Generator Shut Down	AM/PM	Min	at least 5 min	
# Seconds between Pushing Test & ATS Transfer (Use stopwatch)		Seconds	max 10 sec	Pass Fail
Name of ATS Used to Start Gen:		n	otate ATS used to star	
Names of Other ATS electrically transferred			All ATS Exercised	PassD FailD
oerational Checks: Oil Pressure:		psi	(Normal=	Passu Failu
Oil Temp:		۰F	(Normal=	PassD FailD
Water Temperature:		°F	(Normal=	Pass Fail
Exhaust Temperature:		٥ <sub>F</sub>	(Normal=	Passu Failu
Air Intake Louver Opened Properly?				Passu Failu
Radiator Fan Cycled On/Off?				Passo Failo
Remote Annunciator Indicates Operation?			Gen in Auto Position	at End?

# **BOTTOM PORTION**

Remote Annunolator indicates	operation			Gen III Auto Fusition a	LIMI	
Generator Load Check	USE ONLY ONE	OF THE FOLLOWING	3 METHODS			
Method #1: 30% of Nameplate Kil	oWatt (from abov	e):				
L1 Amperage	e (Leg to Leg):	amps	Voltage (Leg to Leg):	volts		
L2 Amperage	e (Leg to Leg):	amps	Voltage (Leg to Leg):	volts		
L3 Amperage	e (Leg to Leg):	amps	Voltage (Leg to Leg):	volts		
S	um of Legs:	amps	Sum of Legs:	volts		
A	vg of Legs : A=	amps	Avg of Legs :	V=		
Calculate Exercise Load:	kW = .001732 ×	PF x A x V (subs	stitue # from above)	Pass if	Res	ult
Calculate Exercise Load:	kW = kW=		kVV <sub>e</sub> =	kW >=kW <sub>e</sub>	Pass	FailD
Method #2: Min Exhaust Gas Tem	p	_	Mfgr	Min Exh Gas Temp:		
	Actual Exhaust G	Gas Temperture:	<sup>0</sup> F >	<sup>0</sup> F		1
Method #3: Annual Load Bank (Note	e: OK in lieu of 30%	load for Diesel only	, NOT Nat Gas)			1

#### Load Bank Test DATE: DHONE. CONTA OT NIABAT. CUSTOMER NAME: -7/21/05 Address: Serial: ARR/SPEC: Model #: Engine Make: 1006TAG1 PERKINS ARR/SPEC: Serial: Model #: Generator Make: Zip: 53901 State: WI City. N/A OLYMPIAN Gen. Reg. Model: R230A Auto Start Make: Generator Location: OLYM PARKING LOT (Load Bank is Alternate for Monthly Load Req for Diesel Only); per §6-4.2.2 Model #: Transfer Switch Make: 300 ASCO 1).Continuous for Min 2 hrs; Phase: Voltage: Amps: 2).25% for 1/2 hr; X 240 400 & 104 3 3).50% for 1/2 hr; X Battery Charger: Model #: PBCU6L-AA12 C-CHARGER 4).75% for 1 hr Engine Heater Make: Model #: 9X9720 120 1500 CAI 590-895 OLYMPIAN H2O TEMP ROOM TEMP AMB TEMP EHX ENG ENG AMPS VOLTS GEN KW (deg F) GEN HZ (deg F) L/R %Lo PRESS (psi) PRESS (psi (deg F) HRS RPM В C A В С A 468 181 N/A 74 58 105 1800 131 no gauge 105 232 231 105 231 20MIN 28 42 60 610 181 N/A 74 132 55 1800 no gauge 189 231 231 231 189 189 60 20MIN 51 77 712 74 183 N/A 132 52 281 1800 no gauge 230 281 281 231 20MIN 113 60 231 75 76 769 50 188 N/A 1800 132 no gauge 377 378 377 230 230 230 152 60 20MIN 101 77 802 189 N/A 50 1800 133 378 378 378 no gauge 230 230 152 60 230 20MIN 101 77 806 N/A 133 51 189 1800 230 378 378 no gauge 378 230 230 101 152 60 20MIN



## 6-4.6 – EPSS Circuit Breakers (Level 1 sys)

NEPA 110 Standard for

91

icy and

Posts

- Operate Annually with EPS Off
- Operate Semi-Annual if Med & Hi-voltage
- Test every 2 yr if Med & Hi-voltage





# EMERGENCY GENERATORS

# WHAT WE COVERED

- 1. <u>REGULATIONS (NFPA 101, 99, 110; TJC, NEC)</u>
- 2. COMPLIANCE CONSIDERATIONS
- 3. **INSTALLATION** requirements
- 4. **INSPECTIONS**

# **EMERGENCY GENERATORS**





### JAN '15 - LUNCH & LEARN

WISCONSIN HEALTHCARE ENGINEERING ASSOCIATION Dedicated to Excellence in Healtbcare Engineering

# **EMERGENCY GENERATORS**

Bill Lauzon, PE Heather Werner, BS

Lauzon Life Safety Consulting, LLC 262-945-4567 Website: Lauzon-LSC.com

