COMPLIANCE news

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NFPA 110-2013 EDITION ADDRESSES GENERATOR FUEL OIL MANAGEMENT

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The 2013 edition of NFPA 110 was recently released by the NFPA Standards Council. Chief among the changes in this edition were several changes, including informational Annex recommendations, intended to improve emergency power supply system (EPSS) reliability through better fuel oil management processes. The excerpts below are only partial excerpts, and readers should review the full text of the updated standard, which is available at www.nfpa.org/110. *In the discussion below, note that all Annex language is not mandatory, rather it is advisory only and contains recommendations for user consideration.*

Paragraph 7.9.1.3 was modified to stipulate that "tanks shall be sized so that the fuel is consumed within the storage life, or provisions shall be made to remediate fuel that is stale or contaminated or to replace stale or contaminated fuel with clean fuel." Although these are not in NFPA 110, some popular remediation techniques incorporate filtering of the stored fuel through a series of water separators and media filters, periodic centrifuge cleaning/polishing with high pressure tank agitation and/or mechanical tank cleaning with auxiliary filtration.

Chapter 8 (Routine Maintenance and Operational Testing) applies to both new and existing systems and equipment. Paragraph 8.3.8 was modified to clarify that "A fuel quality test shall be performed at least annually using appropriate ASTM standards." Chapter 2 (Referenced Publications) does not list

appropriate ASTM standards because they are not specifically referenced in the main body of the standard. Since there is no ASTM standard specification for natural or synthetic gas, the NFPA 110 Annex indicates that "industry generally uses pipeline specifications for natural gas quality." However, the NFPA 110 Annex does list the following ASTM standards for fuel oil systems because they are specifically discussed in the Annex:

ASTM D 975, *Standard Specification for Diesel Fuel Oils*
ASTM D 1835, *Standard Specification for Liquefied Petroleum (LP) Gases*

Because fuel oil contaminants (including water) in fuel oil storage tanks can be found in the bottoms of storage tanks, new Annex language now recommends that "special attention should be paid to sampling the bottom of the storage tank to verify that the stored fuel is as clean and dry as practicable and that water, sediment, or microbial growth on the tank bottom is minimized." The new Annex language also states that ASTM D 975 contains test methods for existing diesel fuel. *(Continued on page 2)*

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As a caution – excessive water or other contaminants in a fuel oil storage tank or elsewhere within the fuel oil system can cause emergency generators to fail. This and other fuel oil system issues have been recognized as the second leading cause of EPSS failures. Starting system issues are recognized as the primary cause of EPSS failures. The NFPA 110 recommendations on sampling can help to minimize the potential for this fuel system-related failure mode.

Annex paragraph A.7.9.1.2 contains more recommendations concerning water contamination-related failures and management techniques – "Fuel storage tanks should be kept as dry as possible and have provisions for water drainage on a regular basis. The presence of water can lead to microbiological contamination and growth, which in turn can lead to general or pitting corrosion of steel tanks and components, possibly resulting in filter plugging, operational issues, or a hydrocarbon release to the environment."

Annex paragraph A.7.9.1.2 also discusses the importance of broader inspection techniques – "Regularly scheduled surveillance of the fuel allows the operator(s) to evaluate the condition of the fuel and make important decisions regarding the quality of the fuel dedicated to reliable operation of the prime mover." Although it is not a requirement, Annex Figure A.8.3.1(a) *Suggested Maintenance Schedule for EPSSs*, has recommended weekly checks for water in the Level 1 EPSS fuel oil systems for several editions.

Annex paragraph A.5.1.1(1) contains explanatory material and recommendations regarding EPSS diesel fuel. It now states that the grade of diesel fuel used in an EPSS diesel engine "should be based on recommendations from the diesel engine manufacturer and ASTM D 975."

Annex paragraph A.5.1.1(1) also discusses special precautions recommended for outside storage tanks – "If diesel fuel is stored outside for long-term storage, it may be necessary to use a winter or arctic grade of diesel fuel or to take precautions such as insulating and heat-tracing fuel tanks and lines to ensure that fuel will flow to the prime mover under the coldest possible conditions."

The NFPA 110-2013 Annex also goes on to warn against the use of certain biodiesel fuels in EPSS applications, such as in A.5.1.1(1) – "Where possible, the purchaser of fuel for the prime mover should specify a diesel fuel that does not contain biodiesel, which can accelerate the degradation of the diesel fuel if stored longer than 6 months." Further related discussion is in Annex paragraph A.5.5.3 – "biodiesel blends up to B5 (ASTM D 975, Standard Specification for Diesel Fuel Oils) have much shorter shelf lives than conventional diesel fuel [ultra-low sulfur diesel (ULSD)] and can accelerate degradation processes, endangering the entire diesel fuel supply."

Annex paragraph A.5.5.3 also contains recommendations regarding fuel oil storage tank sizing – "Consideration should be given to sizing tanks in order to meet minimum fuel supplier delivery requirements, particularly for small tanks. Consideration also should be given to oversizing tanks."

Annex paragraph A.5.5.3 also contains recommendations and explanatory material regarding fuel storage management – "Where fuel is stored for extended periods of time (e.g., more than 12 months), it is recommended that fuels be periodically pumped out and used in other services and replaced with fresh fuel."

The NFPA 110-2013 Annex also recommends additional fuel oil system management techniques in paragraph A.7.9.1.2 – "To optimize the long-term storage of fuels for prime movers, the fuel tanks should be kept cool and dry, and the tank as full as possible. Tanks that are subject to temperature variations can experience accelerated fuel degradation, especially if the tanks are outside and above ground or close to an extreme heat source if stored inside a structure. The more constant and cooler the tank temperatures, the less likely temperature-related fuel degradation will occur."

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Annex paragraph A.7.9.1.2 also makes recommendations concerning the air space above the fuel oil within the storage tank, which can be influenced by the size of the tank, the rate of fuel oil usage, the emergency management requirements, the age of the fuel, etc. – "Tank ullage (air space) should be kept to a minimum. Excess air space allows for warm, humid air to enter the tank and condense moisture during the cool evening. Also, prolonged exposure to ambient air, which is 20 percent oxygen, can facilitate oxidative degradation of the fuel."

And finally, in Annex paragraph A.7.9.1.2, NFPA 110 advises that "Fuel maintenance and testing should begin the day of installation and first fill in order to establish a benchmark guideline for future comparison. Laboratory testing services should always be sought from a qualified or certified petroleum laboratory."

TJC PROVIDES MORE CORRIDOR CLUTTER GUIDANCE

By David L. Stymiest, PE, CHFM, CHSP, FASHE *dstymiest@ssr-Inc.com*

TJC continued providing corridor clutter clarifications and expectations in the September 2012 edition of *The Joint Commission Perspectives*®, which is TJC's official newsletter. In this issue TJC Department of Engineering Director George Mills followed up on his August 2012 column by addressing several additional issues including latching patient room doors, corridor walls, corridors and air supply, corridor projections. He also provided additional guidance related to the CMS waiver policy regarding certain provisions of the 2012 *Life Safety Code*.

Mr. Mills discussed the differences between the required patient room door latches and the self-closing or automatic closing devices that are not required for patient room doors. He discussed TJC's expectation that accredited organizations are required to have in their fire response plans a process to ensure that patient room doors close and latch in a fire emergency. Because this requirement must be in the facility fire response plan, staff are accountable for checking patient room doors and closing the open ones during both fire drills and non-drill fire events.

Mr. Mills discussed *Life Safety Code* differences in corridor wall requirements between fully-sprinklered buildings and unsprinklered buildings. Basically, the article summarized the *Life Safety Code* provision that corridors walls in fully-sprinklered compartments are permitted to be non-fire-rated partitions and "shall be permitted to terminate at the ceiling where the ceiling is constructed to limit the transfer of smoke." In unsprinklered buildings however Mr. Mills stated that the corridor wall should have a 30-minute fire rating and "walls that extend from the floor to the underside of the floor or roof above." Of course as with any other fire rated partition, corridor walls in unsprinklered buildings would not be permitted to have unsealed penetrations.

The *TJC Perspectives* article also reminded accredited organizations that TJC does not allow corridors to be used as a part of an air supply, air return, or air plenum. This prohibition is based upon the concern that a corridor air flow usage such as that prohibited could also spread a fire.

We recommend that accredited organizations read the entire referenced TJC article since it contains additional information not presented here.

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ASHE Publishes New Management Monograph *"Managing Hospital Electrical Shutdowns"*

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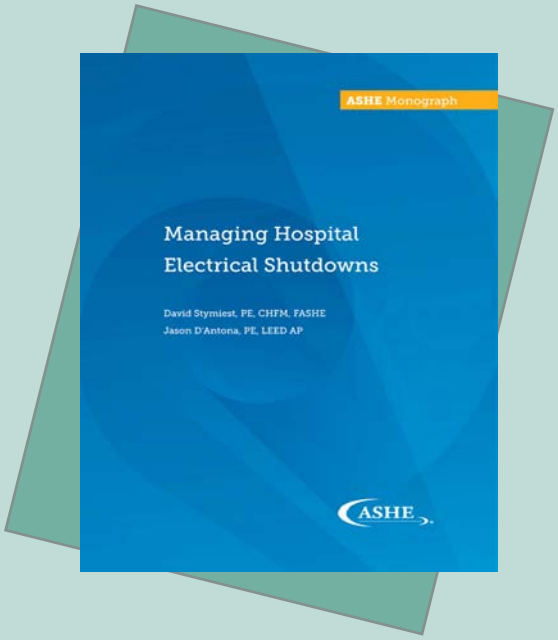
ASHE recently published a new management monograph that provides guidance for managing safe electrical shutdowns. It is available free of charge as a downloaded protected PDF to all ASHE members at http://www.ashe.org/resources/management_monographs/mg2012stymiest.html.

Hard copies are also available to both ASHE members and non-members in the ASHE Online Store as ASHE catalog # 055978.

This 55-page monograph covers the following major topics in depth:

- Why electrical shutdowns should be planned
- Things to consider before planning a shutdown
- Planning a shutdown
- Electrical system considerations during a shutdown
- After the shutdown
- Planning for future shutdowns
- Numerous appendices with samples and templates to assist hospitals in their shutdown management activities

Our *Compliance News* readers are welcome to submit comments, suggestions and questions by email to: DStymiest@ssr-inc.com.



PUBLICATIONS AND SEMINARS

Publications

"Risk and Reward - Assessing the need for electrical system shutdowns," *Health Facilities Management*, August 2012
"Managing Hospital Electrical Shutdowns," *ASHE Monograph*, July 2012

Seminars

October 4	New England Healthcare Engineering Society Annual Conference, Springfield, MA, "Emergency Power Challenges in 2012 and Beyond"
October 8	Florida AHCA Fall Seminar, Orlando, FL, "Managing Hospital Electrical Shutdowns" and "IPD Case Studies"
October 30-31	Tennessee Hospital Engineers Association Annual Meeting, Nashville, TN, "Code Update: FGI Guidelines 2010 Edition and Impact to Hospital Construction in Tennessee," "TJC and Enforcement of Surgery Room Relative Humidity Limits," "HVAC System Selection Processes in an Integrated Delivery Methodology," and "Continuous Commissioning and Energy Cost Management in Existing Healthcare Facilities"
November 7-9	Midwest Healthcare Engineering Conference, Indianapolis, IN, "Continuous Compliance - Maintaining Constant Survey Readiness" and "NFPA 110/111 Update - Paying More Attention to EP Reliability"
November 16	Louisiana Society for Healthcare Facilities Management Meeting, Eunice, LA, "NFPA 110/111 Changes for 2013"