THE ARCHITECT'S ANGLE

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Do You Know That…?

- Emergency generators come in several "flavors": natural gas, diesel oil, and bi-fuel units which use 80% natural gas and 20% diesel oil. We favor diesel or bi-fuel units because gas is not interruptible. Diesel also burns more efficiently than natural gas and diesel generators generally have a smaller footprint than natural gas units. This is especially critical in interior installations where space is tight and the logistics of getting a new generator in place are difficult.

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Emergency Power – Your Facility's Life Line

In general terms, your facility's Essential Electrical System (EES) consists of a stand-by generator power source and the branch circuits which deliver emergency power where it is needed. However, in real terms, an EES is much more than its technical definition. It is the life line your residents and staff depend on to keep critical systems and equipment operating during an emergency.

Emergency power systems in health facilities are governed by the National Fire Protection Association (NFPA) Code 99 entitled "Health Facilities". Per NFPA 99, facilities providing critical care are required to have a Type I EES. This, of course, includes hospitals but also includes nursing facilities with dialysis and/or respiratory units. A Type I EES divides the emergency power system into a number of branches, each connected to an automatic transfer switch or ATS. The function of each ATS is to "switch" a given branch from normal to emergency power. The life safety branch, powers emergency & exit lighting, fire alarm & nurse call systems, emergency communication systems, etc. The equipment branch serves a facility's boiler plant, walk-in refrigeration and similar systems. The critical care branch powers dialysis suites, vent units, operating suites and other high risk treatment areas.

By creating separate EES branches, the risk of failure of any one branch is reduced. This multi-branch configuration also allows for load-shedding whereby the total load on the generator can be temporarily reduced if there is a danger of an overload.

Even older hospitals have a Type I EES. However, most nursing homes that are more than five years old do not. Therefore, when dialysis and vent units first appeared in nursing homes 10 years ago, it was customary to apply to the Health Department for a waiver regarding a Type I EES. In most cases, these waivers were granted.

Given the growth of on-site dialysis and vent units in nursing facilities, these waivers are no longer being considered. Our office is currently working on a number of EES retrofits in nursing facilities which are adding and/or expanding dialysis and vent units. Our first concern is with the condition and capacity of the existing emergency generator. We must determine if there is sufficient surplus emergency power to serve the new or expanded loads. In other cases, the generator may be at or near the end of its useful life. The facility may also wish to increase the capacity of the generator (or add a second generator) to handle the entire building, not just the code mandated systems & equipment. This is becoming a more common scenario given today's concerns over terrorism and looking at recent power grid failures like the Con-Ed fiasco in Astoria. Although the cost of replacing or duplexing a generator is not small ($150k for the generator alone) there are energy grants and/or rebates available that may cover most or all of these costs.

Once the generator issue is resolved, then a new critical branch is run from a new transfer switch to circuit breaker panels serving the dialysis and/or vent units. Ancillary supporting systems such as water treatment and medical gas equipment must also be connected to the new branch. A certain amount of local rewiring is usually necessary, especially at bedside duplex receptacles in vent rooms converted from "standard care".

John W. Baumgarten Architect, P.C.: Recent EES Projects: