

# Before You Purchase a UPS System:

## Five Questions You Must Ask Your Vendors

By George Heidekat

**A BLANK SHEET OF PAPER** and two words: quality and efficiency. That's where the design for the just-completed Data Realty, LLC, data center got started.

In selecting mission-critical facility systems, "We had the rare opportunity to work from the ground up," says Tom Panozzo, chief technical officer for the South Bend, Indiana-based provider of

colocation, cloud computing, data analytics and disaster recovery services.

But a free hand in specifying vital hardware—such as uninterruptible power supplies (UPSs)—doesn't eliminate the hard grind of evaluating technologies, vendors and products. Panozzo and his team spent more than a year on the road, visiting manufacturers and touring installations, before selecting a UPS supplier for the greenfield project.

Eventually, Panozzo found himself working closely with Jim Hughes, the veteran sales manager for central US, Canadian and strategic national accounts at Mitsubishi Electric Power Products.

This fall, with two 500-kW Mitsubishi 9900B units in place, and 16 more on track for installation, Panozzo and Hughes both expressed satisfaction with the Data Realty selection process and its outcome. They agreed to share a few lessons with EPS readers, and together came up with a short list of questions that any manager in the market for a UPS system should ask before cutting a purchase order.

### **Question 1: You say your product is efficient, But, specifically, at what loads does it start to get efficient?**

**Tom Panozzo:** "This is a great way to start the conversation. We insisted on an efficiency curve demonstration from every vendor we talked to. A lot of UPSs are efficient when fully loaded, but in the data center world they never are fully loaded. Other industries might load them up to 80, 90, 100 percent; in our industry they seldom get above 60. Whatever industry you are in, ask the vendor, "Do your efficiency numbers

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apply to the loads I'll actually be running at my facility?"

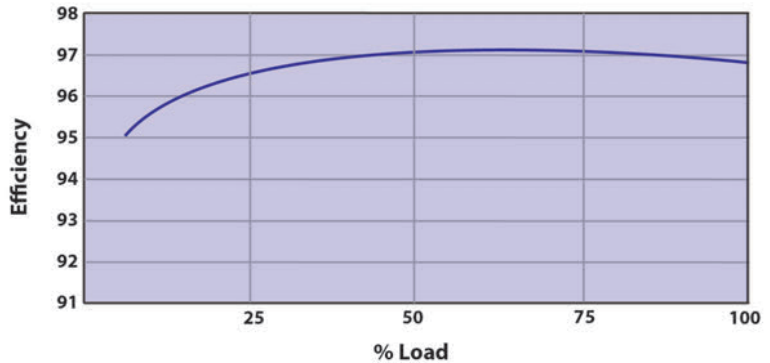
**Jim Hughes:** "A related concern is that every potential supplier is going to show you graphics that indicate high efficiency. The real question is, 'Can you prove it?'"

"Your vendor should be able to bring you to a test facility (like ours, in western Pennsylvania) and show you how his UPS performs under realistic conditions. You should have access to case studies and client contact information, for further proof. And you really want to ask for an efficiency guarantee."

**Question 2: Are your UPSs really 100 percent load-rated?**

**Tom Panozzo:** "A lot of manufacturers might describe their product as a 500-kW UPS, but if you actually ran it at 500 kW you might find yourself very unhappy. Just for example, I know that Mitsubishi's units are slightly underrated, so you could run them at 100 percent load all day long."

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UPS Capacity (kVA)	AC to AC Load			
	25%	50%	75%	100%
300	95.7	96.8	97.0	96.9
500	96.1	97.1	97.2	97.0
750	96.2	97.1	97.0	96.8

“Whether that’s practical or not is a side issue; sometimes we find ourselves doing things we don’t want to do. Sometimes you end up in situations you couldn’t anticipate. But I’m confident that if we ever — against our better judgment — had to run our Mitsubishi UPSs at 100 percent load, they would hold it, because they’re rated to do so.”

**Jim Hughes:** “There’s a lot of marketing hype out there. Be careful. What some published data really indicate is that, when push comes to shove, the product may meet the requirement. Before you buy, you need a warranty, you need guarantees, you need to see failure data.

“You want a product that’s conservatively engineered to perform to specifica-

tion all the time. That has to be baked into the technology — into the IGBT, logic, and sensing capabilities.

“Step load performance can tell you a lot, even if it’s unlikely to happen in the field. Ask how the UPS would perform going from 0 percent load to 100 percent. You should see little to no disruption on the load sine wave. If the technology you’re looking at can do this without borrowing from the battery, you’ll get better battery life.”

When selecting a UPS, you need to test the UPS to verify that the technology does not rely on the battery system during a step load. Below is test data depicting 9900B UPS step load response with the battery disconnected. (insert graphic: StepLoadOutputVoltage.jpg)

### **Question 3: Power factor: Does your UPS operate at unity?**

**Tom Panozzo:** “On other projects, I’ve run into nominally 300 kVA UPSs that were actually rated at just 260 KW, so they weren’t unity. The data center world lives by the number of kilowatts we can sell, and our calculations usually come down to the amount of power you’ll be able to deliver, and how much computing power you can support. UPS manufacturers usually publish the bigger number — ‘Our UPS is 300 kVA.’ — but that becomes quite irrelevant if the other number is only 260 KW.”

“The Mitsubishi 9900Bs, for instance, are unity power-factor UPSs, so their 300 kVA really does mean 300 KW. And when it all comes down to dollars and cents, the kilowatt number is the one that matters — it’s critical, and it makes a big difference to your bottom line.”

Jim Hughes: “Tom nailed this one. If the design is at unity, your UPS will provide more KW to the load. That’s what mattered to Data Realty. They didn’t care about kVA — they wanted to know how much power they could get.”

### **Question 4: What can you tell me about your operating failures?**

**Tom Panozzo:** “I was impressed by the fact that Mitsubishi actually publishes their UPS module operating failures. That speaks volumes. I can think of a lot of UPS manufacturers who, if they published their failures, would be

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Data Realty adopted a modular build-out model, developed by Environmental Systems Design, Inc., of Chicago, in designing its new 50,000-square-foot data center in South Bend, Indiana. It features:

- Unlimited power capacity with redundant generators and backup support in a 200 w/sq. ft. configuration
- Two substation feeds, each with multiple 138 kv lines powered by American Electric Power
- A hydroelectric/nuclear/coal power mix (less than 60 percent coal-based)
- A location adjoining the nation's second-largest transcontinental fiber infrastructure
- Last-mile connectivity via Indiana's Metronet Zing fiber optic network.

The installation's first phase includes nine 500-kVA UPS units, to be followed later this year by a nine-unit second phase.

out of business tomorrow.

“So don't hesitate to ask the vendor, ‘As a company, do you track your failures? Is that information available to me as a client? And can I see it before I buy anything?’ These are key questions. Everybody has failures.

“Quite frankly, the Mitsubishi documentation was a key component of our decision to buy from them. First of all, they're up-front enough to provide it. In fact, they offered it before I could ask for it. And second, it's just damn impressive, because their failures amount to almost none.”

**Jim Hughes:** “We trust our machines so much that we showed Tom exactly what's gone on over the last eight years. That's unique in the industry: failure analyses for every unit in the field, every failure we've had since 2006. It might involve a device, a human interface, an LCD screen, a capacitor, things like that.

“At the end of the day, our failure rate is extraordinarily low. And, more important, none of the few failures that we have had ever dropped or even jeopardized a client load.”

### **Question 5: How is your support service?**

**Tom Panozzo:** “This is the one I al-

ways ask. Service is so vitally important — you need to have confidence in it before you close the deal. Your supplier should be able to quantify his level of service by answering follow-up questions like these: ‘How long does it take to get me a part I might need?’ ‘How long will a service technician take to reach my site?’ ‘Can we buy a spares kit?’ ‘Can you recommend which parts your tech will want us to have on hand when he arrives, so we can pre-buy them proactively?’ ‘Do your techs travel with parts on the truck, or do they show up and then have to call in and have them sent out?’”

**Jim Hughes:** “This tends to be a front-loaded business, where the focus is on the initial design and installation. What happens frequently is the customer gets a lot of attention before the purchase. And then, once you buy, all those vendor people who were so interested sort of disappear.

“The Data Realty team, for instance, had a very short lead time, so we all knew that when the equipment came to the site, they'd have to install, start up, and commission it to meet a deadline. To do that, they were going to need significant support from their partners on the manufacturing side. That would hold

true all through the total life of the system — in service support, parts support, and engineering support.

“So Tom asked about customers who could vouch for us. And we were able to give him contact information for several high-profile clients, and they were more than excited to talk about what we've done.” □

#### *About Mitsubishi:*

*Headquartered in Warrendale, Pa., Mitsubishi Electric Power Products, Inc., is the subsidiary of Mitsubishi Electric US that supplies electrical and electronic products, systems, and services for the North American and global power systems, metals production, rail transportation, and water treatment industries.*

*Working as a comprehensive business partner, Mitsubishi Electric Power Products offers application assistance, engineering studies and analysis, and after-sales services. We set new standards for quality, reliability, delivery, and installation while meeting customer requirements with the very latest technologies, products, and systems.*

*Full information about Mitsubishi appears at [www.meppi.com](http://www.meppi.com).*