Data Center Interview – May 13, 2015 @ 10:30 AM

INT: Just to get us started, can you tell me what types of data centers your company operates and what industries you serve?

R: These are mega data centers; publication facilities and it’s a wide variety of clients that we have. Anything from financial based plants to social networking.

INT: What’s your role in the company with regard to data center management?

R: I oversee all of the facility operations for all the sites.

INT: And I understand you currently have four sites? Is that right?

R: Yes that’s right.

INT: And as a warmup question to just start getting us into the meat of the questions here, I wanted to ask what are the top three factors you consider when either setting up a new data center or doing a major upgrade to a data center?

R: I think when we are doing new data centers we look at location and availability of fiber connectivity, as well as client base, the availability of power. For upgrades it’s looking at the energy efficiencies of what we are upgrading to or what we’re replacing and of the features and functionality of that equipment.

INT: So the energy efficiency would be specific to upgrades as opposed to new facilities?

R: Well, when we are doing a new facility when we are spec’ing out the equipment, we are also looking at energy efficiency to gain the lowest PUE because that’s very forefront in everybody’s minds now, as it should be.

INT: So location and energy efficiency. Anything else?

R: The fiber availability and the power availability.

INT: Oh okay.

R: Yeah, all that coupled with the client base…the potential client base for that area.

INT: So those things determine what is an optimal location?

R: Oh yes.

INT: In a facility.

R: Yeah. You wouldn’t go to Mississippi to build data centers for financial clients.

INT: Can you elaborate a little bit more on why those are…the location availability of the connectivity and power, those factors are the most important?

R: Yeah. Number one, we can just talk to power availability. Let’s say you want to build a mega data center, you have to make sure there’s power availability to build a mega data center. Not to build one and then find out that you can have a megawatt or you needed fifty megawatts. So those relationships and the power availability with the power providers are very important. The availability of land; we’ve found as we’re looking to expand in other areas what we thought would be easier somewhat to expand into, whether you are looking at Greenfield, which is just land that needs to be cleared and buildings built or Brownfield, which is you found a warehouse and you can renovate it into a data center. It’s not always what you thought it would be until you start to do your homework. So you really have to vet that out. The connectivity aspect; you have to make sure there’s fiber and you have to validate what that latency is for those areas where you are going to connect to the fiber.

INT: Starting from the idea that you’re going through the process setting up or upgrading a data center, where do you gather information on what new equipment and technologies and facility management strategies are available?

R: We do a lot of research with our vendors. So we’ve got partnerships or relationships with all your major UPS providers, all your major switchgear providers, generator providers. Your vendors that supply the solutions for heat removal or containment of heat or cold, supply air; we have relationships with all those different groups. So of course with these relationships they are either contacting us to tell us what their latest and greatest is, or we are going to them to ask them what their latest and greatest is. With those relationships they know what we’ve used in the past, they know what the efficiency was of that equipment so when we go back to them and say here is the latest request for proposal, then that is sometimes when they will say well we’ve got this that’s coming out in the next couple months; you may want to come to the factory to take a look at it, etcetera.

INT: Do you also go to any outside organizations or conferences or anything like that as an information source?

R: That’s a good point. I didn’t even think about that. I am glad you brought it up. So we are a member of the Uptime Institute so we go to a lot of those conferences. We also attend some of the other conferences like ASCOM and then I am a board member of the Local 7/24 exchange chapter. So we go to a lot of those events. And you are right; the vendors will be there with hundreds of booths set up to also tell you what their latest and greatest is, if you are not in the loop; a vendor that maybe you don’t have a relationship with and you wouldn’t find out about them unless you went to one of these shows.

INT: Do these different sources, do you feel like their estimates of energy use and performance are pretty reliable or do you feel like the estimates aren’t necessarily themselves particularly useful?

R: Well I think that they are in the ballpark when they publish those numbers. And to be quite honest, I don’t trust the UPS numbers that are published and I’ve proved it at the facilities, because a lot of their numbers are published on simulated loads and not indicative of loads that we would see in a data center. For example, UPS’s use resistive load banks at their facilities to prove their efficiency numbers, but my load in the data center is not resistive; it’s reactive with a leading power factor. Once you apply that reactive load and leading power factor, the efficiency numbers start to come down. That’s what they should be doing out there at their facilities.

INT: So their estimates are not applicable in a real world setting?

R: Exactly.

INT: And so do you have to do your own in-house testing before going with the latest and greatest technology trying to get your own estimate?

R: What I’ve been doing is want to send our an RFP, I put into the RFP that when we come out to do a factory witness test that the provider will provide reactive load banks down to a .95/96 or so leading power factor and they will prove the efficiency of their equipment under those test conditions. Some have been open to that. Some have given a little resistance. But I told them you are probably looking at what’s going to be the next standard.

INT: So basically you have your own specifications for testing and you as part of your project you’ll get the vendors to carry out those tests.

R: Yes, because here at the site I have stationary resistive load bank tests. So even if we did it here at the site it wouldn’t be as indicative as the reactive testing that would need to have been done.

INT: Onsite testing isn’t super feasible for you, but getting them to do the testing is –

R: Yes, because the testing we –

INT: -- it’s a better quality of information.

R: Yeah and the testing we would do here onsite is similar to what they would’ve done with their resistive load bank there. So really one of us has to do the reactive load bank test. Again, I’d rather it be them because I’m not going to buy a very expensive reactive load bank for the site.

INT: That’s interesting. Thanks for filling out the online questionnaire, by the way. And from that I see that you…well we’ve already talked about your [COLO 10:58] facility, so you are leasing most of your facility space to other companies.

R: That’s correct.

INT: I’m curious about how your tenant’s contracts are structured with you. Do they pay based on space, number of racks or charges including power use?

R: It’s usually they pay their reserve fee. So let’s say their lease is a megawatt so they are going to pay a reserve fee that I am going to reserve the megawatt for them and then they are going to pay for their actual consumption. So we’re not really dinging them on their footprint or their number of racks and we’re not charging them by the circuit. We’re just charging on the reserve for the megawatt and then what they’re consuming of the megawatt and it’s a pass through on their…I think there might be an administrative charge on the billing side of it. But really just reserve and actual consumption.

INT: And so that’s actual measured consumption after it’s been used.

R: Yes. We’ve got a branch circuit breaker monitoring on every breaker that is feeding all their equipment.

INT: Are you also leasing them the servers or simply the space?

R: Just the space.

INT: Who is determining when major power and cooling infrastructure type of systems need to be fixed or upgraded? Is it you or the tenant or some combination?

R: The tenant won’t have any say in any of that stuff. It’s usually looking at the longevity of those pieces of equipment and whether it’s 15 years or greater. So we monitor the efficiency of the equipment over the years and once we determine that you run a new total cost of ownership analysis or something similar and you determine that it would be better to upgrade that equipment than to continue to operate at the current efficiency. I would say it’s usually around that 15 year point so that’s pretty much how we’ve operated.

INT: So you’re looking at things on a 15 year upgrade cycle and if you feel like there’s new equipment that’s more efficient that might make sense to upgrade at that time?

R: Yeah. Yeah.

INT: Is it that your data center run as a single organization with one budget, one team, one supervisor or are there different silos with separate budget, separate team, that kind of thing?

R: Yeah. There’s a lot of different teams. [Clearing throat]. Sorry. There’s a lot of different teams across the company and every team has their own budget. There could be IT operations, It development, critical facilities operations, critical facilities engineering, critical facilities design development. So you have all these different groups and they all have their own budgets.

INT: What kind of coordination is there between these groups when some of these major facility decisions are being made?

R: There’s a lot of coordination. Operations is involved with the design and construction and engineering because they want to have our feedback and they want to have our experience with the equipment. Because if they’re using something we’ve used in the past, maybe we don’t want to use it anymore and they wouldn’t know unless they had the conversation with the operations team who has been using the equipment in a different build and maybe didn’t like it and it was very prone to failure, etcetera. Or let’s say they’re looking at newer technology. I’ve got to own and operate it after they’ve commissioned it and turned it over to operations. What if I did some of my own research and found that you’re making mistakes; maybe they would want to hear my feedback on it. So there’s a lot of coordination between those departments.

INT: Which department would be most concerned with electricity costs or energy efficiency or is that the same crossover multiple teams?

R: There’s three teams that are really concerned about that. One is the they’re changing the name from quality assurance of this team to energy efficiency I think is going to be the new name of that team, so that’s his job. So without him paying attention to stuff, he wouldn’t be up to snuff on what he’s here to do. So you’ve got that team and then of course you’ve got the engineering team and operations team. So if we’re having to report on power usage efficiency every month then I get asked a lot of questions; why was PUE not 1-4 this month or it was winter; it should’ve been 1-2-5. Why was it 1-3-0? So it’s pretty important. Then I go over to engineering and say what’s your take on it; maybe we should design something differently or we need to change the operating range of air sight economizing or something. So [inaudible 16:01] all of us.

INT: Would your tenants ever be involved in those discussions since the energy costs are getting passed onto them?

R: Their models where they have a fixed PUE. So if there was a fixed PUE that was negotiated in their contact it would probably be in my benefit to meet that PUE or exceed it. If we’re greater than that PUE then the customer is not effected so they don’t really say anything about it. But for me it’s bad for me because I’m paying them on the fixed PUE and I’m greater than it, so we’re losing money.

INT: On the one hand, the tenant is paying for electricity costs up to a point of the agreed upon PUE and then beyond that you guys are on the hook for the remained of it?

R: Yeah. We get whatever that delta is. If they are paying 1-4 and for some reason are running 1-7 then they’re not going to pay the delta between the 1-4 and the 1-7; they’re going to pay whatever their costs were multiplied by that 1-4 factor and then I’ve got to eat the delta.

INT: Would you say that’s your most common contract type with your tenants?

R: Yeah I think it’s most common with everybody. And I’ll tell you, it’s getting very creative that they’re asking for even lower PUEs than I think that I could do on average sometimes. So it’s looking to be pretty common.

INT: And do you then charge them higher rates to get that lower PUE?

R: No, because if you try to do that then you’re not competitive with the 50 other data centers here. So you’ve got to be careful with that. Sometimes you just have to eat it. And then also, let’s say that they’re on that one megawatt; they’re going to not come in day one at one megawatt. It could be a ramp that takes four years to get to that one megawatt. So PUE is going to suffer greatly in the first half of that ramp, because you’re going to have to run the whole chill water plant to support them, but they don’t have the IT to counter that. So I think there’s some mechanisms where they get creative with that locked in PUE and get smarter about it to say hey in year one we’re not going to guarantee the 1-4 because there’s no way you’re going to have the IT through all to get us there. Let’s say in year one we’re going to guarantee a 1-6, but the end goal is by the time you consumer your megawatt, we’ll be at 1-4. So sometimes you have to have those creative conversations. But I’ve seen some clients that hey 1-4 from day one, that’s it.

INT: So that’s a major factor that your plants are demanding and they’re shopping around in the different providers and a guaranteed PUE is one of their main bases for deciding who to go with?

R: Yes.

INT: Given the important of energy efficiency and all that we’ve been talking about, could you tell me about any recent major investments you made at one of your facilities that improved energy efficiency?

R: Cold aisle containment. That’s one of them; one of the ones that we’ve recently deployed that’s had really good results. I can’t recall specifically if the ROI is…I think it was less than two years on the cold aisle containment project that we just did. There were a few projects that they did a few years ago before I joined and one of them was to change chill water supply temperature. Traditionally folks are doing 45 degree chill water. Our company went to 60 degree chill water. Massive benefits from changing the chilled water operating temperature. And anytime you do that you usually get a big change in your supplier temperatures from your air handlers or your computer room air handler [inaudible 20:08]. So we’ve gone to anywhere from 68 to 78 degrees on the supplier temperature, because we’re trying to use that whole window of Astra ATC 9.9 to where we’re not exceeding 80.6 at the top most server on the rack. And these are some of the ways that we’ve seen we can get to that point and utilize that whole window. So you can see a lot of our energy efficiencies were around airflow. There were others that were around airside economizing. So we’ve been deploying airside economizing in the data centers so that we don’t have to run a chiller plant at all. And we’ve also taken advantage of waterside economizing where we can use a cooling tower in a plate and frame heat exchanger and bypass the chiller altogether as well. The issues we ran into with airside economizing or limited number of hours based on dew point, humidity, temperature, particle counts, things like that.

INT: For all of these technologies, are these something that you have rolled out now across all of your facilities?

R: Not the cold aisle containment. We’ve rolled out airside, waterside, through all the facilities and the higher chilled water operating set points and supplier temperatures. So all those have been rolled out to all the facilities. We’re just not completely sold on cold aisle containment for all data centers, but it’s still under consideration. It is retrofitted into some of them, but we didn’t design around it for the new design that we’re doing right now.

INT: Can you elaborate a little bit on why you thought it would work well in some of your facilities but you’re not convinced for the others or for the newer facility?

R: Yeah. The problem is we all thought by 2015 that every customer would be a high density customer and that the trend was going in the direction of high density data centers and it’s not happening. So if you’re not using high density clients you don’t usually need to do cold aisle containment but the ROI is not there. But when you do have high density clients like what we had in the one where we did implement it, it worked well. We’re still seeing far too many clients that are running five kilowatts or less on their racks and fewer and fewer that are doing 10 to 20 kilowatts on the racks. So it is all rounded.

INT: So it’s just not worthwhile for certain clients.

R: Yeah. For the low density it just doesn’t work out. It’s just not money well spent so far.

INT: Based on the questionnaire that you filled out, basically you use pretty much everything in terms of facility management and in fact, you mentioned several of those factors. And it sounded like the temperature set points, airflow, airside economizers; you’ve rolled them out across facilities and they tend to unlike cold aisle containment, they tend to be worthwhile for across the spectrum of facilities? Is that correct?

R: Yeah. It’s more effective for the higher density ones.

INT: Would that also be true of some of the other facility strategies you mentioned like air flow management airside economizer, waterside economizer? Do the payoffs also depend on the density?

R: No those are not dependent upon the density, because those strategies will work with any density.

INT: And then from the questionnaire and the fact that it sounds like you guys don’t provide the servers so your company does not make investments to improve server utilization? Is that correct?

R: As far as I know. I just…I don’t get involved in anything inside the racks.

INT: So it’s possible that your company is involved in that, but that’s not your area.

R: Yeah. We have our own IT department. They could be involved in those things for the MDF, our main distribution frame and our intermediate distribution frames where we own the servers. They could be involved in those things; I just don’t know.

INT: And it sounds like you monitor equipment utilization? You monitor utilization of servers, storage, cooling?

R: Not servers, but utilization of our cooling and electrical systems. Yes.

INT: It sounds like you probably don’t know the answer to this, but one of my questions was whether you or your clients are actually using all the energy efficiency technologies that are built into the servers.

R: Yeah. I don’t know about that.

INT: Are there any facility management energy efficiency type technologies that you have chosen not to pursue at this time? You haven’t pursued cold aisles in your newer facilities. Is there anything you either haven’t pursued across the board or don’t want to roll out in all of your facilities?

R: Well just remember its cold aisle containment. We still use the hot aisle/cold aisle arrangement in the data centers, just not the containment that we’ve standardized on.

INT: Thanks for clarifying that.

R: Yeah. I don’t know. That’s a really broad question. I just don’t really know how to answer that one.

INT: Thinking of when you are talking to your vendors or going to conferences and hearing about some of the latest and greatest stuff, are there any examples that come to mind as something that you’ve said that doesn’t sound like that’s going to work for us?

R: Yeah. There’s some of the new technologies around…well maybe not new. I think it is heat wheel technology. You’ve got ENDO GRO coolers technologies that people are using. You’ve got the compressor less refrigeration technology. So there’s a lot of what appear to be excellent or great ideas. It’s just tough because when you’re not dealing with something that you’ve deployed and have experience with for let’s say five years, it’s hard to make a transition into that like Google drive around with cars that don’t have drivers. Well I’m not so sure that I want to be involved in that and I’ve had clients along the similar lines of this great new technology that they think it’s great, but I’m not so sure about.

INT: So something that’s just too cutting edge hasn’t been tested enough in the industry. That’s the idea.

R: Yeah.

INT: What about when you have decided to try something out? What tips the scales with trying the cold aisle containment at the facility where you’re using it?

R: We had seen it used in the past at other facilities or other providers or our peers used it. So we had a lot of good feedback from them and feedback from some engineering consultants on how effective it would be. And then it was all right, you can have the...let’s just say the $20,000 product or the $10,000 product, what are the pros and cons when you are starting to talk about dollars and cents. Because really you are talking about some panels. It’s not ground shaking here or earth shaking. So it just took a lot of conversations with a handful of different groups to come to a decision that would make the most sense.

INT: Do you also use maintenance or training strategies to reduce energy use?

R: Yes we do.

INT: Could you give an example?

R: So one of the trainings that I like to do with the team is about airflow management. So when you look at…let’s say you’re looking at a couple rows in the data center and the racks and what type of tile is at these racks, what are their KW consumption, what’s the actual airflow to the tiles, what’s the [spec] pressure. So then you start to do calculations to do a correlation between what do those racks need and what are you providing them and how much are you wasting. So I try to train the guys on being cognizant of these ideas. And the flip side of that is what if you are trying to do a 10 kilowatt rack with a 25% proof tile? It’s not even going to work. So trying to educate them on proper types of tiles that are needed for racks. And then we do walkthrough’s to the data center every day and the guys are recording readings and we are trending those readings and we can also trend readings from our building management systems. It’s the interpretation of the readings that you are capturing and what it all means. Let’s say that you have an area where you have a 70 degree supplier temperature. Your return air temperature is only 75 degrees. To me something’s wrong or we’re over circulating the space. I would like to see return temperatures of 90 degrees or more so I know I’m getting a great temperature drop across the chilled water cool and I’m getting the greatest capacity out of that piece of equipment at its greatest efficiency. Not very efficiency with a five degree drop across the chilled water cool. So we try to train and educate our teams on that, not just to be watch standards, but to be meaningful contributors to the team.

INT: Some of those interpretations, you don’t have an automated monitoring system that can tell you those types of things. You need to have actual guys on the ground looking at the data and doing those daily walkthrough’s to make some of those determinations.

R: We don’t have any predictive analytics around efficiency right now. We’ve been talking a company called Rominet because they have a program that looks at your anticipated baseline efficiency. It looks at your current efficiency and it reports on the delta and lets you know that those are areas where you need to look at the differences and evaluate what the problem is.

INT: I have a list of factors here that I wanted to ask about whether there tend to be any tradeoffs with energy efficiency, or on the contrary, whether they might actually be synergies between these factors and energy efficiency across some of the different technology that you’ve talked about. One of those is just general data center performance in terms of uptime or reliability. In your experience, have you seen any tradeoffs between energy efficiency and the uptime reliability component?

R: Certainly. So latest and greatest UPS technologies wants you to run the UPS and bypass and if it’s in bypass you can get upwards of 99% efficiency out of UPS. If it’s in double conversion, delta conversion or liner reactive mode, it’s 97% efficient. So I could gain two 2% efficiency if I was willing to put let’s say the banks current load on raw utility. Now I go and talk to the bank and say hey I’ve got this great technology; I’m going to put you on bypass raw utility 99 5/9% of the time. Should we have any utility anomaly we should transition seamlessly to double conversion UPS or line interactive, whichever version it is. But the bank is going to come back and say heck no or the hedge fund is going to say heck no; I’m not down for that. So you would have those tradeoffs where maybe you want to get 99% efficient on a UPS design but your client base is not going to let you get there. But let’s say it’s a client base that doesn’t care and doesn’t give you feedback, now am I comfortable with putting all my clients on raw utility most of the time and the UPS is going to function as a UPS if it needed to or should do so. So yeah there’s some tradeoffs there.

INT: Have you seen any of those tradeoffs with the technologies that you’ve actually adopted…airflow management airside economizer, waterside economizer, etcetera?

R: I’ve seen it in the positive direction as far as ASC, WSC. So all those have worked out really, really well and we’ve saved a ton of money. Now obviously the tradeoff was you’ve got to pay a lot of money up front for designing your system around being able to do airside economizing and you have to be selective if you’re going to do it in the south. I don’t think you are going to have very many run hours that you’re going to be able to do airside economizing due to dew point and humidity and temperature. But maybe if you’re in the northwest it’s going to work out awesome for you, except you could have some challenges with humidity. So there are some tradeoffs with those. As far as waterside economizing as long as you’re cooling tower design is right it’s going to work for you in a lot of areas. But like I said before, if you’re going to Texas, I don’t think either of those technologies is going to work out very well for you there.

INT: So if you’re using that in the right climate that you’re not taking any hit on reliability or uptime or you would maybe even get a benefit of improved reliability?

R: Yeah. Yeah. I think it would improve reliability because you would have those systems that you could always fall back on.

INT: But the catch is that you can only use it in the right climate or it’s only going to make sense in the right climate.

R: Yeah. Yeah, the right climate. And it’s even been tough…let’s say over here in the east coast it’s been a little tough to use some of those technologies over here. But in the west coast it’s worked out really well.

INT: At the beginning of our conversation you were talking about how location was one of the important factors for setting up a new data center and you were talking more about connectivity and power and where the clients are. Is this climate factor also a driving factor in where you locate your data centers?

R: It is and you had asked about looking at the newer technologies. We’re looking at an area that’s in the south right now and you can’t…I think that we have standardized around centralized chiller plants traditionally east and west coast. Don’t think that’s going to work out very well in the south so we’re looking at what are the newer technologies out there that would be more applicable; direct expansion. What are the latest and greatest designs in that or some of these other technologies that use the compressionless refrigeration systems? How do those work? How well are they? So we are having to look at some of those options as we look to the other areas due to [clients 35:52].

INT: So first you’re choosing the location based on all the factors like clients and power and stuff and then that’s helping drive the technology that you’re looking for; what technologies are going to work.

R: Exactly. Yes. That’s right.

INT: What about tradeoffs between energy efficiency and maintenance or repair issues? Have you seen anything along those lines?

R: I have seen that with some of the more efficient UPS designs that some of the…let’s say they’ve gone to transformer less. So there’s more components that are in the UPS than maybe what I used to have. Even though its transformer less obviously it’s less the transformers. But there seems to be more technology inside the UPS than what we were used to and it seems that there is more of a need to spend money on the maintenance and upkeep of these newer systems. So this you are going to get more efficient but you’re going to spend more money on operations and maintenance over the lifecycle of that piece of equipment. You have to look at that tradeoff and make sure it still makes sense.

INT: Are there any technologies that had the opposite where you gain on energy efficiency and you also gain on the maintenance and operations side?

R: I do believe there are. And I think that some of the other UPS technologies that might be with flywheels, if you were willing to go in that direction; to go with a flywheel UPS I firmly believe you’re going to gain the efficiencies out of it and you’re probably going to…well you might not depending on who the provider is gain on the maintenance aspect of it. So I think that’s definitely there.

INT: Are there concerns about financing some of these new technologies? Do you look at utility or state incentives as a main factor and what drives which technologies to try out or is that not an issue?

R: We would like to if they offered them in these areas. There are some incentives and we’ve taken advantage of those on the west coast. But there weren’t any incentives over here in Virginia or east coast that I was aware of. And I’m not sure about the ones in the south just yet.

INT: Did that then effect your technology choice, the fact that you were able to get incentives in one location but not in another?

R: It did.

INT: Were you able to go with some more cutting edge energy saving technologies then in the western locations?

R: Yes, because we were able to get a little bit more creative on let’s say the airside economizing design; got a little bit more creative on that because you knew you had the incentive money that you could work with. And also on the cold aisle containment, there’s incentive money that we’re able to get on that because we’re able to prove how we were able to change the supplier temperatures, less run time on the chillers, etcetera.

INT: Does your company or do any of your clients have companywide energy efficiency policies that help drive your technology choice?

R: We have to be Energy Star rated so that’s part of what drives some of the equipment selection and the way that we operate the data center.

INT: Is that something that your tenants demand or that’s just your own company’s policy?

R: We haven’t seen that any of the tenants demand that you have to have it, but when they come to interview the site we do go over the list of certifications that we have and we make sure that they’re aware that we do have that certification. And then of course if they have specific PUE requests they’re going to say we want to make sure you can meet this PUE and that you have designs around that.

INT: Thinking about all the factors you’ve mentioned that affect your investment decisions, I am curious about how your company does these ROI or payback calculations when you’re deciding on a new technology. And certainly it sounds like you incorporate upfront costs and energy costs and then I’ve also heard you mention maintenance and operation costs. Are there any other factors that would go into your ROI calculations?

R: The physical footprint that the equipment takes up. So one that I recently did was on UPS and let’s say that one UPS is 50 feet long, the other UPS is 30 feet long. So you’ve got this 20 foot Delta that maybe is over a four foot span. So you have got all that extra square footage. And let’s say you’ve got 20 or 30 of these systems, now you can start to see where that’s going to cut into space that could be used for something else. It might even be space that can be sold as additional data center space. So you lose that with the larger UPS designs. So you are right. I’ve looked at energy efficiency, maintenance costs, major equipment replacements over the years, energy consumption. So I think those are all the major factors that we did on the analysis. And I ran that over let’s say a 15 year period of time and the other thing was…I guess it would be the same for all of them, how would utility rates change over that time period too.

INT: So how do you get projections or make assumptions about how utility rates are expected to change over time?

R: I know. That’s like looking into my crystal ball over here to get that out. [Laughter]. Sometimes we look at how they’ve changed over the years, which for us, it hasn’t been a lot of changes. So they’ve been pretty consistent. We just try to forecast what they might change to and it’s usually only a few sets and then how is that going to impact it over time. So it’s really you talk to the providers…say it’s the west coast or the east coast provider and ask them if they have any predictions or any trends that they could share with us.

INT: And do you incorporate uptime or reliability issues into your ROI calculation or are you just -?

R: Specific.

INT: Sorry. Go ahead.

R: We have specific conversations with each one of them about their meantime between failure, what those NTBF rates are, what those components are that have the higher NTBF and specifically, which ones have the lower NTBF and we do take that into accounts as well.

INT: So you are able to quantify or put a dollar value on that to put in your ROI calculation?

R: Yes. And there’s one thing that the manufacturer is going to tell you, but we also can go out to our third party providers that service these types of equipment and get an independent feedback from them as well and compare that and see if what they are seeing a third party service provider and that equipment lines up with what the manufacturing might be telling as they see as the types of failures.

INT: Some companies in other industries have told us that they require certain hard payback periods to invest in a new energy saving technology and that would often be a lot less than the amount of time before they need a major upgrade. So what we’ve heard from a lot of companies is they require a technology that pays back for itself in reduced energy consumption in say one to three years, even though that equipment might last for 10 years. Does that type of decision making come into play in your company? Is that similar to rules that you use or is that quite different?

R: Yeah I think that one’s a little aggressive though, because realistically the equipment is probably going to last you 10 or 15 years, depending on what it is. So we would be more open to 3-5 year payback. I wouldn’t count something out because it was just the one or two year…couldn’t meet a one or two year turnaround or something like that. So we are usually looking at 3-5 years.

INT: And is that a hard rule of thumb based on the calculations that we were just talking about?

R: Pretty much. I can’t say that it’s in concrete somewhere that everybody standardizes around it. But for me in operations when my guys are running calculations and looking at the payback, I’m looking at something in that 3-5 year window.

INT: That is still of course quite a bit less than if you expect to hang onto the equipment for say 10 or more like 15 years. Can you talk a bit about why there would be that big gap in wanting to payback in 5 years if you hang onto it for 15 years?

R: Yeah. [Pause]. Let’s say you’ve got a system that’s operating and you’ve already paid for it and now you’re just paying on the recurring costs and things like that. When you are trying to put some of this in front of accounting they are really going to look at your calculations, your numbers and what you’re saying the payback is and stuff like that. It’s really like you start to get under a microscope and people want to see how are you going to run this thing for 15 years? We want to see this payback as quickly as possible. So then reality sets in that hey if we want to go with this new technology it’s going to cost X upfront. Its capex so maybe it can be spread out. But operationally speaking, it’s going to take 5 years. I think it gets tough sometimes because you’ve got so many different departments that maybe have their hands in that type of decision making.

INT: So it’s convincing the other departments?

R: Yeah and if they saw the ROI was 6 or 7 years, I don’t think anybody would get on board with it. But if you were able to get it at 5 years or less, I think it’s easier to get people on board.

INT: Is that 3-5 years or 5 years or less, would they apply that to all investment decisions across the company and across different departments, not just related to energy efficiency or upgrades?

R: I couldn’t speak for IT side of the house, but I think over here on our side of the house in operations/ energy efficiency engineering, we’d be okay with stuff that’s 5 years or less, especially if it’s something we’re going to keep for 15 years or something like that.

INT: Is part of the concern about uncertainty, like you don’t really know if you’re going to get the 5 year payback so you’re being a little bit conservative for that reason or do you feel pretty confident in the payback calculations?

R: We have to be very firm with what we put in front of the team or you’ll get picked apart and annihilated so you better have done your homework and feel like you’re…I wouldn’t say conservative but very accurate on the data that you’re presenting. So you just want to spend your time and make sure you’ve done the right calculations, you’ve gathered the right data and you’re reporting as accurately as possible, because that’s what folks want to hear. They want it to be accurate. They don’t want ballparks.

INT: Great. Well that’s actually all the questions I have for today. This has been really helpful. I wanted to know if you had any last questions or comments or something that I didn’t ask about that you think is relevant like investments in energy efficiency?

R: Yeah. With all the data that you guys are gathering, will there be any type of report that’s provided to the folks that participated to let us know what some of the ideas there were that you all were able to gather and some of the commonalities and challenges and things like that?

INT: Yeah. So we are going to prepare a report and that’s going to be publicly available online and then a version of that will also be submitted to an academic journal. And so what we’ve talked about is making sure that BCC is aware when the public report goes up online so that they can share that with all their members who helped us recruit folks to participate in this study.

R: Okay.

INT: So absolutely.

R: Okay. All right. Well I did enjoy having the conversation. I think there’s people that have a passion for what they do and don’t mind some of these types of questions, especially if they can help make changes our here in the way people think and the way people select their equipment, etcetera. That’s just because you’ve used it for the last 10 or 15 years doesn’t mean you need to keep using it, so to speak.

INT: Yeah. No. We really appreciate you taking the time to share your expertise and getting this input so thank you very much.

R: All right. No problem. I don’t have anything else.

INT: Great. Thanks Chris.

R: All right. Have a good day. Bye.

INT: Bye.

[END OF INTERVIEW]