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Anti-Trumping duties

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Illustration: Roman Hrncar

Photo: SunEdison

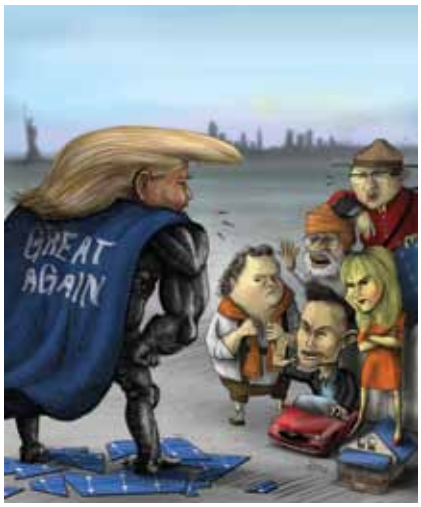

Illustration: Roman Hrncar

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Applications & Installations

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Helge Biernath is the President and CEO of Sunstall, which provides installation and services for utility-scale projects.

Laying the groundwork

Ground-mounted installation: Pile driving quality goes to the very foundations of a PV array, quite literally. Helge Biernath, CEO of Sunstall, speaks to **pv magazine** about the importance of getting the foundations and footings of a PV array right, in the final Black Sheep article for 2016. In this, being mindful of the weather, Biernath notes, is a vital factor.

pv magazine: What are the main activities of Sunstall in terms of solar project construction?

We are focusing on the mechanical installation of ground-mounted arrays, across the U.S. This involves all aspects of the installation to include support for the geotechnical analysis. Once on-site we lay out the pile locations, manage and distribute all materials, drive the piles, build the racking, and install the modules. We are licensed electricians in California, so we can also do the electrical portions of a system in California. Depending on the licensing regulations in each state, we may be limited to pile and racking installation, but this is handled on a case-by-case basis with each client.

Additionally, we provide I&M, which is what I call inspection and maintenance. We don't manage the operation of the system, but we are the boots on the ground when it comes to trackers and ground-mounted arrays. There is no real standard for the maintenance and inspection, so it's kind of an 'a la carte' thing. One person wants to have an I-V curve tracing, another person only wants to have the combiners checked with an IR camera. It depends. Hopefully one day we're going to get to a standard.

For the construction of a park, are you contracted by the EPC?

Yes, most of the time. But it could also be the project developer or the subcontractor, or the electricians. We are among the top 50. We're just focusing on the C&I space, which you can sometimes call utility-scale. We're starting with a couple of hundred kilowatts all the way to 20 MW. That range is our sweet spot. That will be our main focus moving forward, when the big fields are going to disappear.

You say installers like you are under a lot of pressure in terms of time and workload. Isn't that normal in a competitive business?

For sure: Time is money. But it is sometimes questionable if you have to install a system, that has to work for the next 20 years, at the worst time of year. Especially when you look at the north-eastern states of the U.S. and all the weather circumstances you'll face. Are those assets going to last and perform?

What would be a good time frame to install a 10 MW project, for example?

From 6 to 10 weeks, but it depends on how complicated the project is – terrain, time of year, available work force, etc. Everything done before the winter is preferable. In some states you can't productively work at certain times of the year. We went to Minnesota last year in December, for the pile testing, and that was the latest you could do it. We got stuck a couple of times just getting out into the field to do the testing and it took a full-sized truck to pull us out of the field. They told us that construction can start again maybe in April.

In those states they understand that they can't do anything during the winter. In other states just because it's not frozen they believe they can still build everything. Everything can be done, you just need the money available to make sure you can deal with the circumstances and the delays.

Pressures arising from the U.S. tax calendar have sometimes forced installers to work in poor conditions. This can lead have an adverse effect on the final quality of an installation.

Around this time of year in North Carolina there will be a lot of rainfall because of tropical storms. That results in a lot of rainfall on the field and you have to find a way to deal with it. We sunk some equipment in North Carolina last year, because the field couldn't drain the water. This is a problem, and you either can't work or you lose equipment.

What is the reason for the time pressure?

The tax man comes on December 31, and then it's over. So everything needs to be done at a certain point to get the [solar Investment] Tax Credits. This results in pressure to get the fields built to a certain percentage completion to be able to get the tax credits. On the other hand, you want to spend the money when you're close to that point, so you don't have to finance it in-between. That's the driver at the end of the day. The tax credits are 30% of the investment, which is a big driver.

Is there a discussion going on that this is not a good situation? How could it be changed?

I don't think so. As long as my colleagues are not fully taking that into account in their calculations, the contractors are just going to push work to that time of year. So it's a question of how many are going to be left standing when the margins are shrinking. It might change when subcontractors are telling EPCs, 'sorry but we can't do it during the winter, or you have to pay an upcharge of 20% because of all these climate issues.' It's not just that things are a little colder and heavier and it's just not that nice. There are impacts: Productivity goes down and if you have injuries, worker compensation is huge. We also have to pay the increase of the insurance rate for a couple of years, so it will impact us for a long period if you have snow and ice on the ground. We had one lady literally being stuck in the mud for half an hour last year, until somebody actually saw her and was able to help her. Those are conditions that are not productive and sometimes unsafe.

"Everything can be done, you just need the money available to make sure you can deal with the circumstances and the delays."

What are the most common quality problems that you see?

As we're focused on the foundation and then building up from there, I see that there is not enough time spent on the risk analysis of the soil conditions and general project conditions. I already mentioned the issues of drainage. Also civil works are sometimes not checked, which might not be a big problem today, but it could be a bigger problem tomorrow.

BLACK SHEEP: A LOOK BAAAA-CK AT 2016

In 2016, **pv magazine's** black sheep series got to the heart of a series of quality issues that have nagged away at the solar industry for years. Taking the form of Quality Roundtable discussions at the leading solar shows, and supported by anonymous industry tip offs and investigations, the black sheep debates have shone a light on some of the darker corners of PV. Here is a brief look back at this year's highlights.

When bypass diodes overheat: **pv magazine's** third Quality Roundtable hosted during Intersolar Europe in June revealed a case in which junction boxes overheated and caused brown discoloration on the backsheets of PV panels. The case, discussed during the Roundtable event, reveals how the chain of responsibility can be extremely difficult to unpick, leaving investors scratching their heads and potentially footing the bill.
Had the module or junction box manufacturer been present during the discussion of this case at the third Roundtable they would have done well to slip out of the room. The final verdict of most of the participants was to find them guilty of supplying inferior quality components, earning them the "black sheep" tag. Issues and individual cases are discussed during the Roundtable without company or brand names.

Burnt out, incompatible connectors: PV panel manufacturers selling plug connectors as MC4 compatible is nothing unusual. This case, discussed at Solar Power International in September, looked at two operators that installed such modules are now struggling with lost insurance coverage and fires. The operators wanted a solution that would reinstate insurance coverage, but that was not so easy. In the meantime, there already had been a series of fires. Approximately 2 megawatts of PV plant capacity that went into operation in 2011 is affected. That is the story from the point of view of the operator.
The reason for the termination of the insurance coverage, says the operator, is that the plug connectors are not true Multi-Contact plugs but, according to the module manufacturer, merely a more or less compatible connector.
The exact terminology and the agreements between the EPC company and the module manufacturer can no longer be reconstructed, as the former is now insolvent, which makes the case far more complicated. At places where the module cables were not long enough and at the end of strings, the EPC service provider connected the module plug connectors to Multi-Contact plug connectors. Problems are now showing up in these spots.

Melting backsheets, broken cells: In September 2011, an EPC installed some 8,800 Chinese-manufactured PV panels in southern France. A mere three months later, more than 90% of the modules had snail trails. The investor informed the EPC of the problem. The EPC countered that the snail trails had no influence on the quality or yield of the modules. In August 2012, the investor contacted the module manufacturer directly about the snail trails and has yet to receive a response, despite numerous calls to China.
As harmless as it sounds, this case illustrates how one problem led to another and grew ever more complicated and disastrous. It was not until mid-2013 that the investor, who also operates the solar farm, noticed grave problems for the first time. The investor's analysis of monitoring data revealed that the energy the PV farm was yielding was 5 – 6% lower than expected, which in his estimation was due to module damage. According to the investor, an on-site inspection and thermographic study of the farm revealed that some 450 modules had hot spots with temperature differences of 30 kelvins, or more, in thermographic images. According to the investor, some 70% of the affected modules had brown cell areas indicating overheating. Some even had scorched busbars. While there were other modules where some of the backsheets had significant blisters or even melted areas.

Get involved in 2017: **pv magazine** is sticking with its crusade for quality next year. Quality Roundtable events will be hosted in a range of exciting and fast-growing markets. New investigations into cases submitted by the solar community will continue too, so stay in touch and join the crusade!

I heard recently that there is a big site where a whole field is under water, and that is simply because the drainage of the site was not properly assessed beforehand. This is the biggest thing for ground mounts. Also how much quality control is actually being done when materials are delivered on-site.
Materials received at the site are checked for quantity and visible damage/quality defects. And there are usually checks or certification at the production facility. Are we missing an opportunity to prevent problems that potentially exist by not doing a sample quality check of critical components after they have arrived at the site and before they are installed? People will normally find a problem when it is not working, then you start the whole process of finding out what's going on and whose fault it is.

There appear to be two points here: One is that good geological analysis is not being carried out, and the other point is testing at the site. Who is liable then if things do go wrong down the line?
At the end, whoever was in charge of purchasing, whether it was the EPC, the project developer or the owner. More and more owners are buying the pieces of equipment, so how they transfer the ownership and who is in charge is difficult to say. But for me, there is just a lack of quality control in that regard. I don't

"What I would love to see is that we have a more skilled workforce overall." – Helge Biernath.

think that in any other industry you would do it that way. There is a lot of pressure on pricing, so you should double check what your vendors are promising and do your own due diligence. On a 10 MW project you should have enough money to be able to do that. It is for your own benefit and for the benefit of the whole project in the long run.

> **"It's not just that things are a little colder and heavier and it's not just that nice. There are impacts: productivity goes down"**

Why do you think there is no realization of the importance of this kind of testing on the investors' side or the EPC side?
Perhaps the focus of investors and EPCs is more on production, which is certainly the end of the day metric, but it seems to me that a bit more diligence in the geotechnical aspects and confirmation of component quality will help deliver the desired production more consistently for a longer period. Obviously the car industry is leading in that regard and has had a lot of success.

You have a European background. It seems like you are saying there are lessons to be learned from Europe?
What I would love to see is that we have a more skilled workforce overall. This would help to mitigate some of the issues. But unfortunately we don't have the dual system of vocational training in the U.S. which would support the solar industry tremendously. I feel it's not as easy or productive as it is in Europe, partly because of the workforce issues, and partly because of the size of the country and the different challenges this brings. And you see that in the pricing.

Is pricing for installations cheaper in Europe than the U.S.?
For sure – 100%. It is probably 50% in Europe compared to what it is here on certain projects. When I hear numbers from my colleagues in Europe – the installation, the productivity, real costs – there is no way we can get even close. There is similar weather in some areas in Europe, so the weather conditions can't be the only factor. And sure, when you work in the desert you won't have that in Europe, so that is different, but still the overall qualifications in Europe are much higher and that helps a lot to drive the costs down, as productivity is much better. ◆

Interview by Michael Fuhs