8121 Zangle Road N.E.
Olympia WA. 98506

Washington Utilities and Transportation Commission
1300 S. Evergreen Park Drive S.W.
Box 47250 Olympia, WA. 98504-7250

Subject: Standards for Interconnection to Electric Utility Delivery Systems.
Docket UE-060649

I am a private party with a knowledge and interest in small-scale generation that is both grid tied and off grid.

First, concerning WAC 480-108, The question of the external disconnect switch. For safety purposes it is essential. Utility crews must know where all such disconnects are on the system and they must be accessible. This requirement must not be limited to Net Metering producers. Any independent producer must be subject to this rule. Reasonable exceptions to this rule are powerhouses manned on a 24/7 basis and those cases where the utility chooses to put the disconnect device under supervisory control. The disconnects open or closed status still needs to be verifiable visually to an external viewer.

The issue requiring a dedicated transformer. I think that if we would look at this issue in light of the history of large SCR DC drives the answer would be obvious. In the 60's and 70's large SCR drives were applied without isolation transformers. There were many problems. Many isolation transformers were put in retroactively. Electronic frequency synthesizers are very analogous to SCR drives when it comes to waveform, di/dt ratios etc. The dedicated transformer isolates the independent producer from having to use a shared ground, and reduces the impact of the harmonic influence the independent producer has on the system. There is the need for one clear exception to the rule and that is if the independent producer is generating with a rotating synchronous or induction machine rather than with an inverter. A less clear exception possibility is if the independent producer is very small. It reminds me of the Ham radio operator who is screwing up his neighbors TV. The question is: Do we want to spend a few dollars for transformers or for lawyers to litigate neighborly disputes. One thing to

keep in mind is that the isolation transformer used by the small producer using an inverter doesn't have to be the utilities distribution transformer, it can be his own that is matched to the inverter KVA. I most cases this is a much less expensive approach with the same result.

I would like to address questions 1,2,3,4 and 5 all together. First, I would like to state that the terms transmission and distribution are not very precise definitions. I know that utilities have their definition of transmission and distribution but this definition is not always the same between utilities. Some simply use system voltage to make the distinction. Is a 115 KV feed to an industrial plant part of the transmission system or is it distribution? We think of BPA as being a transmission organization but is their station service transmission? Some people say that distribution is radial and transmission is double fed or looped, but is the network in downtown Seattle transmission?

I think we would agree that every system is different and interconnect rules should reflect this and be based on sound engineering practices that are specific to that system. Probably about the only systems in this part of the country that approach standardization are the REAs, or those that use REA standards. That is a small number of the total.

Some rules effecting interconnected independent generation are pretty straightforward like synchronizing standards. The sticky wicket has to do with protection. WAC 480-108 assumes that the 25KW and under producer will have negligible impact on the system protection. In general this is probably true but I am sure we can find exceptions. Revamping relaying to accommodate the small producer can be very expensive. Putting these relay revamp engineering costs entirely on the independent producer could stop small producers all together.
On the other hand, if the utilities protection is already well engineered and coordinated (before the advent of the independent producer) a larger independent producer could completely upset the protection on the system. This is a real cost and the benefit is certainly for the small producer, who should bear the cost, one way or another.

Since the relay scheme, settings and coordination, and fault current data of the utility system prior to the independent generation connection is proprietary to the utility, it is easy for the utility to price the project out of feasibility by claiming the need for a major relaying upgrade, justified or

not. Rightfully so, the utility is very sensitive to its responsibility to have protection at a reasonable level to minimize liability exposure.

If you put 10 experienced relay and protection coordination specialists to review 5 protection schemes for a system, they will not agree on the acceptable system. They will likely agree on a ranking of the protection systems (good, better and best) but not what is acceptable. That is a very subjective risk assessment decision by the loss control department based on cost/benefit, not engineering criteria.

It is my opinion that the implementation of independent generation will be severely restricted if it is entirely left to the utility and the proposed producer to negotiating to a point of mutual agreement. This historical negotiated approach will continue to work in proposals of about 1or 2 megawatt and up. Smaller projects will simply be dead on conception.

Since I am one with a bias that the failure to develop small and medium sources of grid connected generation is not in the public interest, legislated rules are going to be required to overcome the problem around the cost of modifying protection to accommodate the small producer. The rules need to be simple, understandable, fair, and above all be supportive of small generation projects which we all need (but which some utilities would rather not mess with)

I would propose some guidelines that would look like this:

1. If the utility felt it was necessary, the independent producer would supply a breaker with a shunt trip and control power supply, of proper ratings. One shunt trip on the breaker would be for exclusive utility use. This does not preclude the independent producer having parallel tripping mechanisms for his own use on the same breaker or to use series breakers, one serving the protection needs of the independent producer and one to provide for remote controlled tripping to disconnect the independent producer in event of system distress.

2. The independent producer would bear the cost (initial and ongoing) of a dedicated signal circuit to the disconnect devise from the closest utility substation. This could be a leased phone line, data line, or wireless link.

the small producer should be priced, by regulation, at 85% of the "new power incremental rate". I know California has a formula for determining this. We could borrow theirs or create our own. I suspect that the differences would not be great.

The object is to eliminate the negotiation that is presently required between the utility and the small producer over rates. Lots of projects stall out over uncertainties about rates and the negotiation thereof.

The regulations should also require that the independent producer pay for all line extensions or other upgrades needed to accommodate the small producer (with the exception of protective relaying which is covered in the 4 basic rules listed above.)
However, the form of payment for these upgrades should be allowed in two forms. 1) cash or 2) Payments to the utility, at some index tied interest rate, amortized over 20 years with the payment coming from the generation revenue paid to the small producer by the utility.

This gives the utility some vested interest in the small producer project even if they have reluctantly been pushed into accepting the small producer.

In summary:

1) Remove the transmission/ distribution references, they confuse things.
2) Allow the utility to shed the small producer in event of a system problem. Require the small producer to provide for this as part of his installation.
3) Provide for arbitration in disputes around protection, they are bound to happen.
4) Legislate a fair rate structure. Small generation projects will not happen without it.
5) Support being a good neighbor, require isolation transformers on inverter derived generation if the utility has other loads on the transformer that serves an independent producer using an inverter.

I thank you for this opportunity to make comments on this most interesting issue. Please do not hesitate if you want additional information.

Yours truly,

Parker V. Holden
Olympia

360-352-2239
pvholden@fastmail.us

cc: Doug Kilpatrick