

ITWG Meeting Notes

NREL Presentation (Slides on Website)

- IEEE 1547-2003
 - 4.4.1 Unintentional Islanding Requirement
 - DR Interconnection system shall detect the island and cease to energize the Area EPS within two seconds.
 - Footnote
 - Provides examples by which the requirement may be met
- Methods of protecting against unintentional islands
 - DTT
 - Other comm based
 - Power line carrier
 - Impedance insertion
 - Phasor-based
 - Reverse/minimum import/export relays
 - Passive anti-islanding
 - Active anti-islanding
 - i.e.: instability induced voltage or frequency drift and/or system impedance measurement coupled with relay functions
 - NREL tests on single-phase inverter based solar PV DG show pure PQ generation and constant output can trip in < 2 seconds at a 4:1 generation to load ratio.
 - Grounding reclosers – demonstrated at Hydro Quebec
- FSU CAPS (NREL Collaborating)
 - Island detection performance is decreased for some scenarios
 - Higher Q factors
 - Other const. PQ gens
 - Nearby Induction Machines

Solar Industry Presentation (Slides on Website)

- From the Joint Utility perspective, the flow chart in this presentation is accurate representing the Sandia guideline screening process suggested for inverter-based DG systems.
- Sandia
 - If all screens fail additional study should be performed
- NREL
 - All were under 700ms.
- PG&E performed unintentional islanding studies in lab
 - All inverters disconnected under 2s
- 2002 IEA Study
 - Risk probability of islanding
 - IEA determined probability 10^{-6} for >5 sec and 10^{-5} for greater than 1 sec
 - Worst case scenario 3×10^{-4} (3700 sec/year)

- Impact of PV penetration
 - Penetration level of PV does not have a significant impact
- Run-on time for unintentional islands
 - Only a small number of balanced conditions lasting longer than 10 seconds at the widest tolerance
 - Conservative estimate with a further safety factor of 2 on top of the run-on time
- Other conservative assumptions
 - 500 circuit interaction opportunities increased to 1000
 - Utility safety practices decreased by a factor of 10 for testing.
 - Trying to test a worst case scenario
- Results of risk assessment
 - Under worst case scenario
 - 5.5×10^{-7} chance per year of incident
 - Roughly one incident per every 1.8 million years
 - .002% chance for a single lineman incident in a 40 year career
- Impact on recloser lifetime
 - Under given conditions the median time for a recloser to be affected by an unintentional island would be more than 49 years
- Hawaiian Electric doesn't require DTT
 - They have the highest penetration of PV in the country
 - DTT was briefly required for the concern of transient overvoltage
 - NREL/HECO/SolarCity proved that transient overvoltage wasn't a concern, the result was that DTT was no longer required.
- Southern California Edison does not require DTT
 - SCE believes that it is the customer's responsibility to ensure that they do not island unintentionally
- Arizona public service does not require DTT
 - Only requires it on a dedicated feeder.
 - PV on shared feeder does not require DTT
 - Projects over 1mw has a more cost effective remote trip capability (operator kill-switch)
- Pacific Gas & Electric does not require DTT
 - PG&E current typical protection requirements do not include DTT (as described in their service bulletin)
 - PG&E reserves the right to require DTT in special cases, but this has rarely/never been done in practice.
 - Removal of DTT requirements was supported by large-scale islanding study done combination with GE Energy Consulting hot-bus/dead-line scheme

Anti-Islanding Group Discussion

- Borrego Solar stated they are not looking to eliminate anti-islanding completely.
- Utilities agree that there is a low likelihood, but there is a high impact
 - Utilities have a different risk profile
 - Not requiring DTT in cases where unintentional islanding is a concern, causes utilities to take on all the risk

- Financial risk – risk of damage to property
 - Who assumes this risk? Generation owner? Utility?
 - Utility’s biggest concern is that it is not clear how different inverter algorithms interact with one another. Many of the studies performed by the industry are limited to single phase inverters only and/or lab environments. Extrapolating results from single phase inverter tests to three phase large inverter-based systems is not proven. NREL lab testing involved simulating wye grounded systems only and not delta systems.
 - A lot of the applications being submitted within NY State are new service CDG and RNM, not behind the meter applications which are off-set by load.
- DTT does not need to be implemented in virtually every application.
 - Utilities prove that it’s needed?
 - Developers prove that it’s not needed?
- Utilities say we need to shift the risk profile somehow, otherwise it will be difficult to find common ground
 - Developers say that this is not the best forum for that kind of policy discussion
 - The risk shift is covered in California’s interconnection agreements that the utilities accept for certified inverters anti-islanding/power quality capabilities.
- Developers feel they have provided significant proof that unintentional islands are extremely, extremely unlikely
- EPRI and NREL are working on an updated Sandia screen for NY
 - We want to make them more definitive and easier to follow
 - Usability
 - Goal is to have a draft by the end of this year
 - Finalized first quarter 2017
 - Coordinating questions for directed feedback to ensure the focus hits on relevant concerns
- According to NREL, field testing may not provide any additional value vs the current testing strategies, and would be incredibly difficult to do.
- What is the plan to address projects that are currently in jeopardy due to DTT upgrade deadlines, but where DTT isn’t truly necessary? – Concern mentioned from SolarCity.
- “We can’t put a price on safety”
 - Is there any additional safety concern on most of these projects that are being required to pay for DTT?
- Add some requirements for the approved inverter list?
 - Possible standard protocol regarding the algorithms relevant to the Sandia Screen
- Utilities mentioned an interest in exploring recloser-blocking as a means of mitigating equipment damaged due to reclosing out of synch

IOAP Group Discussion

- Developer perspective: what are the priorities for the IOAP?
 - Identical look and feel across all utilities?
 - Standard functionality and terminology are critical.
- The portals don’t have to look like carbon copies of each other, but standardized functionality is a necessity.

Action Items

- NY JU to address why UL 1741 inverters cannot be accepted for their anti-islanding functions. Due by 10/27/2016.
- NY JU to provide statewide consensus standard on anti-islanding. Due by 10/27/2016.

Next Meeting

Either week of the 7th or 14th of November?