

Commentary on Disconnect Switches Used in Smart Meters

In a smart meter the remotely-actuated disconnect switch is, amongst other things, meant to isolate the household electrical service from the 240 VAC grid if and when things go wrong, for example if the meter catches fire.

The switch is critical from the safety point of view because if it fails to operate properly the disconnect function will not be accomplished and safety will not be assured. Furthermore, 240 VAC arcing can occur. This arcing creates heat, which can cause the meter enclosure's temperature to rise, and this can lead to electronic components (such as the lithium ion battery) failing and creating even more heat. When the enclosure temperature gets sufficiently high the combustible materials can catch fire, and if the enclosure isn't designed to contain the fire there's a chance the fire will transfer to the structure on which the meter is mounted. A particularly dangerous situation occurs when 240 VAC current direct from the grid starts flowing to ground through the burning/melting meter as a result of a failed disconnect switch. When this happens, high energy arcing typically occurs, and the fire can become very intense and almost impossible to extinguish until the wires are cut or the power is shut off at the pole. Three 10-second repetitions of a fire of this type may be seen at <http://youtu.be/gi4FQmgyGu0> .

The switch with its actuating circuitry, sensors, and reliance on transmitted signals is a complex electro-mechanical system operating in a harsh environment featuring 240 VAC, different frequencies including some in the GHz range, hot sun, possibly burning electronics, water intrusion (from a leaking mast seal, for example), and from time to time high voltage disturbances such as occur with a lightning strike or when power lines inadvertently contact each other - as it seems happened in Summerland recently.

A question of major importance is how reliable, and therefore safe, are these remotely actuated disconnect switches? Regretfully I (we) don't have an answer to this question because, despite requests made of BC Hydro and Itron, documents showing certification and proof of adequate testing to Canadian Standards for both the smart meter and its disconnect switch have not been provided. Nor have I (we) been able to obtain proof of sign-off on safety by a Professional Engineer, as is required in the BC Safety Code.

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