

As spin-off of our research activities, TNO Telecom licenses since mid 2000 a specific technology (principle¹ + implementation) for generating shaped noise, to Spirent Communications in Canada. Since then Spirent has incorporated this technology in some of their noise generating products for xDSL testing. The technology as licensed is not essential to any ETSI xDSL standard. This is one specific solution out of many possible solutions to the problem and will not restrict an application of xDSL standards on testing in any conceivable way.

The advantage of our technology is that the shape of the noise spectrum is user definable within wide ranges, almost regardless of the shape that will be (or has been) defined by ETSI standards. From this it follows that TNO (Telecom) has no commercial interest in the standardization of any particular noise shape or profile other than the need for its strategic partner KPN to create technically adequate and equipment challenging formal standards in the field of xDSL noise testing.

Issues related to ingress noise generation.

The use of a set of discrete tones for RFI testing has a history that also goes back to the early days of standardizing ADSL, or even longer. As with crosstalk noise, there are many ways to implement an ingress noise generator with RFI tones (modulated or not). Various commercially available products have been supporting this.

One way is direct AM modulation of carriers, as is performed in AM broadcast stations. A direct (software) implementation of the associated formulas given in SDSL and ADSL, will also work (and is neither protected by our IPRs). By downloading the evaluated numbers into the memory of a commonly available Arbitrary Waveform Generator (AWG), any set of modulated RFI tones can be synthesized.

The use of random modulation for RFI tones was introduced within VDSL, long before our approach was licensed to Spirent. The addition of whatever type of modulation (random, discrete or no modulation at all) is not making a difference for our patents in this field.

The flexibility of our above mentioned licensed technology is such that it can generate ingress noise as well, simultaneously with crosstalk noise, irrespective of the fact whether the RFI tones are to be unmodulated, discrete modulated, randomly modulated or whatsoever. Again this provides the end-user with the advantage of RFI tones that are easily user definable, irrespective of how many tones are required.

As stated before, our technology is one out of many possible solutions. The associated IPR's are not essential to the ETSI xDSL standards and will therefore not prohibit normal usage of the RFI tones as specified by ETSI in its standards.

Issues related to noise profiles.

ETSI has defined various shapes of the noise spectra that are to be generated ('noise profiles'). As apparently no essential IPR's were claimed, the standardized shapes can be used freely and anyone could build them from scratch by simply following the ETSI specifications.

To assist the xDSL world with means for testing VDSL under noisy conditions, TNO Telecom has used its expertise to evaluate meaningful noise profiles for VDSL. Electronic representations of some of the evaluated profiles were licensed to Spirent Communications for sale to end users as encrypted files. These electronic representations of noise profiles are of course copyright protected by TNO Telecom thus prohibiting unauthorized copies. However, end-users will always have a choice between obtaining these profiles commercially or building them their selves from scratch (and thus for free). Again, any IPR's that TNO (Telecom) might have are not essential to the ETSI xDSL standards and therefore do not prohibit usage of ETSI standards in any way.

Legal aspects and the ETSI IPR Policy

Now how does the above relate to the ETSI rules? The answer is surprisingly simple. The ETSI IPR Policy compels members involved in a Standard or a Technical Proposal to timely disclose any of that member's IPR that might be "essential" once a proposal to that end is adopted. Essential IPR means that it would not be possible on technical grounds to operate equipment or methods complying with a standard without infringing that IPR. If so, that member is requested to declare that it is prepared to grant irrevocable licenses to such "essential IPR" on fair, reasonable and non-discriminatory conditions.

¹ A non-published patent application on this principle is pending. (inventors: by R.F.M. van den Brink and B.M. van den Heuvel, applicant: Royal KPN NV).

The IPR Policy seeks a balance between the needs of standardization for public use and the rights of the owners of IPR. As such, this policy is widely accepted by both industrial and non-industrial partners.

To the best of my knowledge, TNO Telecom does not hold any IPR's or applications thereto that are "essential" to any of the standards in which TNO Telecom is currently involved. Therefore the obligations the IPR Policy imposes in respect to reporting and licensing essential IPR's are not applicable in this case. However, we would be prepared to enter into negotiations with any member wishing to take a license on commercial terms.

Conclusions.

TNO telecom owns some Intellectual Property Rights and applications thereto, related to methods and means for testing xDSL equipment. Those IPR's are not impairing public usage of ETSI xDSL standards. We hold no essential IPR's in standardized noise impairment tests. A spin-off activity has resulted in a method and means for universally generating shaped noise. We wish to emphasize the fact that methods and means for generating shaped noise are not covered by any of the ETSI xDSL standards. Therefore, any IPR's that TNO Telecom might have clearly fall outside the scope of the ETSI IPR Policy.

Furthermore we wish to state that TNO's activities in the area of specifying xDSL noise stress tests are mainly driven by the need for operators, such as our strategic partner KPN, to rely on standardized performance test that are adequate, challenging to equipment and meaningful, and by our dedicated expertise in this field.

We are willing to inform other bodies as well, if so desired.