



Tata Power Delhi Distribution's unique infra-red and voice-response based 'Talk-Back Seal' for detecting meter tampering has reduced power theft and commercial losses.

## THE CONTEXT



The metering and billing of energy consumption is a key measure of revenue for a power distribution utility. Revenues of Tata Power Delhi Distribution (Tata Power-DDL) were adversely affected by power theft even though it ensured that every energy meter installed by it on consumer premises was properly sealed. The cases of theft would occur when consumers replaced official meters with duplicate ones that allowed tampering without leaving a trace.

Hence, in order to differentiate between duplicate and original seals, the company developed a unique Talk-Back Seal, which uses voice-response infra-red (IR) verification to prevent tampering.

## THE INNOVATION



Talk-Back Seals are made of a poly-carbonate material whose transparency is precisely fixed to a pre-determined value. These seals can be authenticated with a properly calibrated IR transceiver. The micro-controller inside the transceiver is programmed in such a way that whenever it transmits IR waves towards an original seal and receives reflected waves in the calibrated intensity, it transmits a voice response, "Genuine Seal", through an electronic microphone. The company's verification team can thus detect if a seal is original or not.

## KEY CHALLENGES

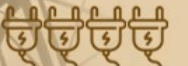
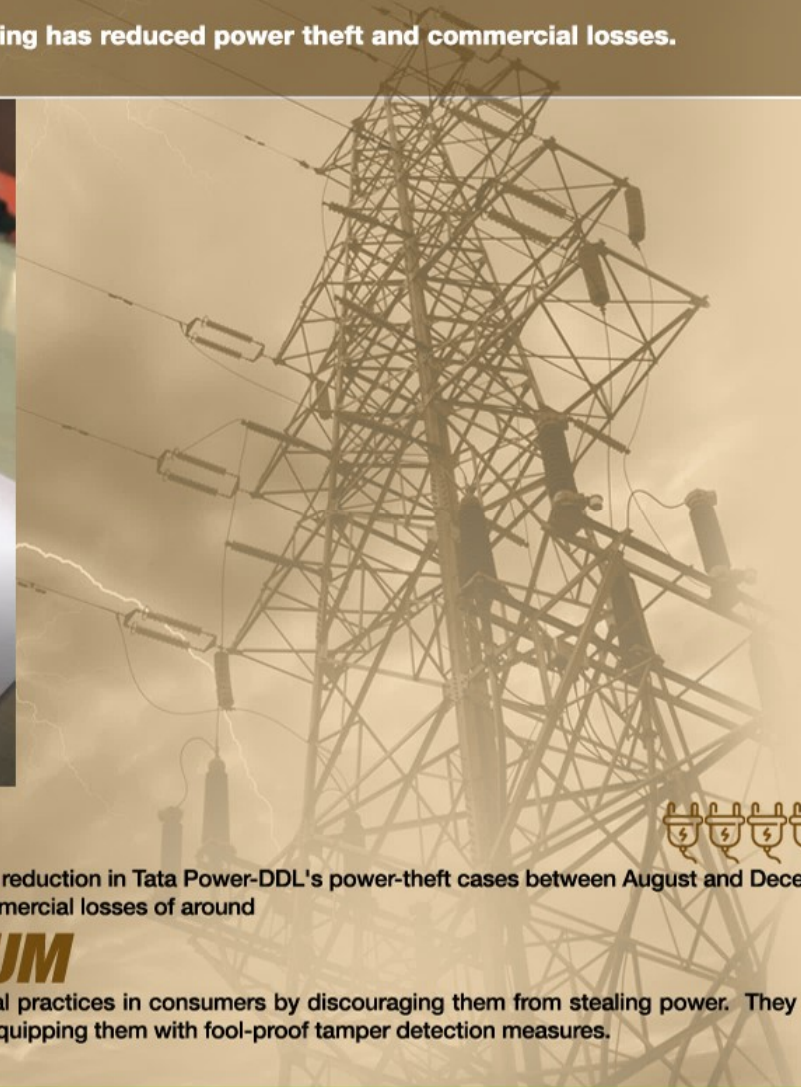


### TECHNICAL CHALLENGE

To select the appropriate polycarbonate material that would allow the detection between a genuine and duplicate seal with fool-proof accuracy. The company conducted repeated trials on different polycarbonate materials to get the maximum outcome in the IR transceiver at a particular transparency level.

### FUNCTIONAL CHALLENGE

To get the field crew to accept the new seals and their detection system. The company conducted several training and awareness sessions with the field crew to make them realise the benefits of the device on-site in terms of the ease in detecting tampering of meters.



## THE IMPACT

The Talk-Back Seals led to an around 12% reduction in Tata Power-DDL's power-theft cases between August and December 2018, resulting in projected savings in commercial losses of around

# ₹8 CR PER ANNUM

Besides, the devices are inculcating ethical practices in consumers by discouraging them from stealing power. They have also made the field crew's task easier by equipping them with fool-proof tamper detection measures.