

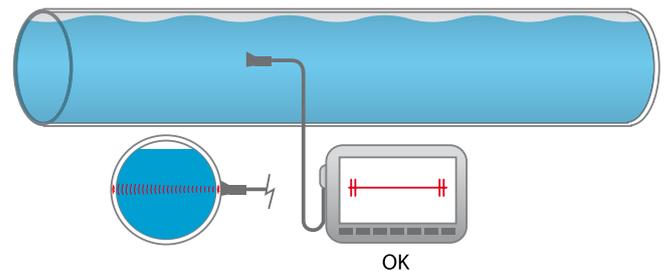
FLOODED MEMBER DETECTION (FMD)



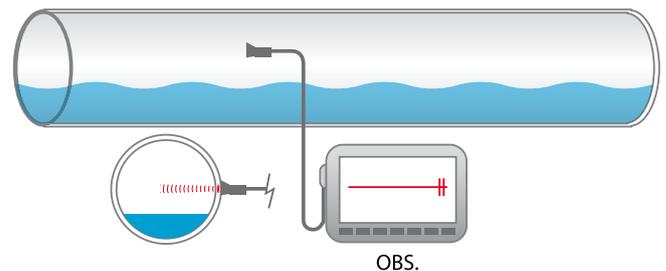
Flooded Member Detection is generally used to verify if the presence of and fill level of a liquid inside a pipe section. The FMD tool can also be used to verify the location of any dense (solid) material inside a pipe section.

The basic principle of FMD is based on the Ultrasonic principle and applied by sending an ultrasonic signal through the pipe from the outside. If there is a liquid present inside the pipe, then a signal from the opposite pipe wall will be detected. If there are no signal from the opposite wall, that will indicate that the signal is either obstructed or there is not enough liquid inside to carry the signal through to the opposite wall. FMD can be applied to any dense material pipe of any diameter and detect the presence of any liquid.

In this first illustration, the FMD tool has already been calibrated for the corresponding wall thickness and accurately detects the opposite pipe wall, because there is a liquid inside to carry the signal all the way through the pipe.



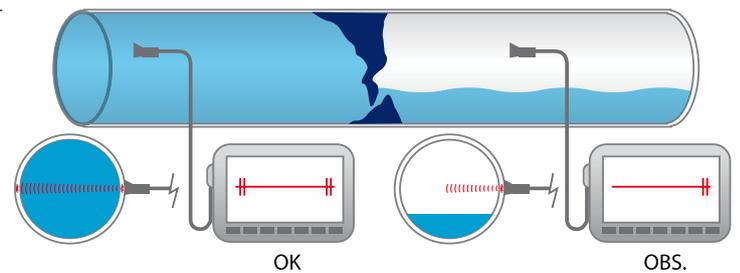
The second illustration shows that only the first pipe wall can be seen and not the second. This is because the ultrasonic signal cannot travel through air/gas and without the liquid to connect the ultrasonic signal to the opposite pipe wall, there will be no signal.



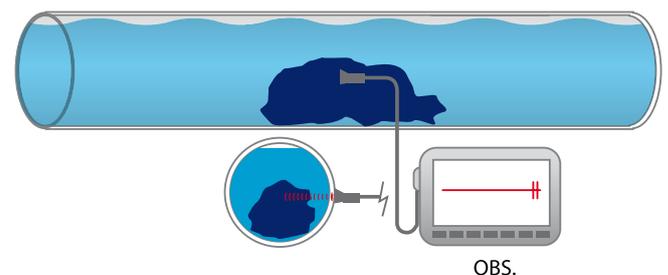
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This third illustration shows a straining inside a pipe and a different product volume before and after the strain point. The FMD tool will quickly establish the liquid "fill level" inside the pipe and this can be marked externally on the pipe and followed along the pipe until a variation in the liquid fill level is found.



The FMD tool can also be used to locate a dense material inside the pipe, whether this is an object or a pig. If the FMD tool is directed at a dense object the signal will either show the dense object close to the pipe wall or no signal at all and the shape of the signal obstruction can then be determined.



The Flooded Member Detection technique involves high range ultrasonic scanning equipment and is best applied by a specially trained and experienced Ultrasonic Level 2 or Level 3 inspector.