

# **Towards Deployment of AI-Assisted Ultrasonic Inspections in the Nuclear Power Industry**

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Ultrasonic testing (UT) is the main volumetric inspection method employed in the nuclear power industry and form an essential part of the non-destructive evaluation (NDE) program of all plants. Many of the UT inspections performed in the field yield large volumes of data that need to be carefully reviewed by multiple qualified inspectors during an outage. Even though most of the data is benign, a detailed review of all data is needed, requiring inspectors to maintain high levels of focus for extended periods of time in an unfavourable environment. To provide an aid to inspector in these analyses, EPRI and Trueflaw have developed machine learning (ML) tools that perform automated analysis of the data to flag suspicious regions for further review and screens out benign regions, thus greatly reducing the volume of data requiring human analysis. We will discuss the value of such a tool and how it can benefit the industry in several ways, as well as present the numerous assessments performed to date that impart trust on it even under field conditions. Ultimately, we will showcase an example of a field inspection assisted by this tool which yielded the same outcome as traditional analysis even though the inspector reviewed only 2% of the data volume, and how qualification through performance demonstration is attainable following current practices.