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NDE of MST Wheels Based on Multi-Technique Approach

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Abstract

Mobile Service Tower (MST) is a 75 m tall and 3500 t structure which moves on rails and is being used for launch vehicle integration. The structure is supported by four wheel bogies and thirty two forged wheels of double flanged type. Each of the forged wheels takes about 150 t load during operation and the structure is kept in anchored condition at other times. After a service life of about ten years, some of the wheels developed cracks along the flanges and all the defects are characterised and their sizes estimated by multiple techniques such as DP, MPT, UT and RT. In order to assess the residual service life of the defective wheels, there is a need for accurate sizing and periodic growth monitoring of the observed defects. Defect size estimation by using discrete or multiple-methods generate large data that need to be processed for meaningful interpretation. As shown by Chao-Drakopoulos approach, the use of multi-source data helped to reduce probability of error and increase estimation accuracy of defect growth. The results of the multiple NDE techniques applied to MST wheels are presented in this paper.