

Review on Pipe Testing Technology

Kadam S. C.^{1*} Chavan P. B.² Pawar G. R.³ Pawar S. S.⁴ Shete Y. S.⁵

^{1,2,3,4} Student, Department of Mechanical Engineering, Sahakar Maharshi Shankarrao Mohite Patil Institute of Technology and Research, Akulj, Maharashtra, India

⁵ Lecturer, Department of Mechanical Engineering, Sahakar Maharshi Shankarrao Mohite Patil Institute of Technology and Research, Akulj, Maharashtra, India

Abstract – Pipelines assume a significant part in the public/worldwide transportation of gaseous petrol, oil based goods, and other energy assets. Pipelines are set up in various conditions and thus experience different harm difficulties, like natural electrochemical response, welding deformities, and outside power harm, and so on. Abandons like metal misfortune, pitting, and breaks annihilate the pipeline's uprightness and cause genuine security issues. This ought to be forestalled before it happens to guarantee the protected activity of the pipeline. As of late, unique non-disastrous testing (NDT) strategies have been produced for in-line pipeline examination. These are attractive motion spillage (MFL) testing, ultrasonic testing (UT), electromagnetic acoustic innovation (EMAT), swirl current testing (EC). Single methodology or various types of incorporated NDT framework named Pipeline Inspection Gauge (PIG) or un-pig gable automated assessment frameworks have been created. Also, information the board related to notable information for condition-based pipeline support becomes significant too. In this review, different assessment strategies in relationship with non-disastrous testing are examined. The cutting edge of PIGs, un-pig gable robots, as well as instrumental applications, are efficiently analysed. Moreover, information models and the executives are used for imperfection measurement, arrangement, disappointment forecast and support. At last, the difficulties, issues, and improvement patterns of pipeline assessment as well as information the executives are inferred and examined.

Keywords – Pipeline, Pipe Testing, Pressure, Methods

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INTRODUCTION

As energy request builds, the energy creation foundation extends correspondingly. Pipelines are prevalently used to move oil, gaseous petrol, water, and other significant assets over significant distances or between nations. They are perceived as perhaps the most secure method of energy transportation. Be that as it may, perils, for example, metal misfortune, pitting and breaks could happen ready to go. These could bring about private injury or demise, monetary misfortunes, and ecological harm. In this way, developing consideration has been given in the examination field to pipeline investigation and checking for condition-based support and underlying trustworthiness the executives.

Pipelines utilized in the flammable gas industry are normally metallic, and the deformities arrangement process comprises of three fundamental parts. The first is the inborn deformities delivered during construction. In this cycle, the steel pipelines are made of billet cemented by liquid metal, and the billet will contain abandons. The greater part of these deformities will be taken out when the head and tail of the billet are cut off, though they're actually exist a

specific number of imperfections staying in the billet. That is the inborn deformities, including shrinkage pits, projecting hot breaks, air openings, incorporations, and so on.

A short time later, these innate deformities in the billet will create exceptional imperfections in the moving system of steel pipelines, including breaks, delamination, hairline, etc. Then, at that point, the hotness treatment, machining, covering and completing course of moved steel pipelines will deliver discontinuities on the outer layer of the steel pipelines too. These outcomes in heat treatment breaks and covering breaks. The majority of these imperfections are appropriated on the outer layer of steel pipelines as outlined in Table 1. The subsequent one is welding deserts which happen during the time spent line welding. During the pipeline administration, breaks and erosion will happen at the intersection of the pipeline network and weld, which will prompt a genuine leakage. These deformities are the focal point of non-horrendous testing (NDT) and primary wellbeing checking (SHM). The third one is consumption shaped during administration. There are two sorts of

break abandons, stress erosion breaking (SCC) and hydrogen incited breaking (HIC).

TYPES OF TESTING

Generally there are two basic types of testing are available. One of these is Destructive testing, which included direct loading over the specimen and continue the operation till the model undergoes failure. And another one is Non-Destructive Testing, in which there is no model undergoes actual failure.

In addition, the testing will also be classified as Contact type and non-contact type testing. Majorly destructive type testing methods are included to the contact type testing methods. Similarly, Non-contact type includes in the non destructive type testing methods. However, there are some exceptions for both the types.

CONCEPT OF PIPE TESTING MACHINE:

As Pascal's Law states that, "For incompressible fluid, the intensity of the pressure acting at one point is equal for all other points." this system works on the same principle. The capacity of the pipe is going to be calculated with the application of pressure from inner side of the pipe till the pipe gets damaged due to excessive pressure. This excessive pressure is to be noted and considered as the ultimate stress condition for the pipe.

WORKING OF THE MACHINE:

The working is simple and easy for this process. As a part of setup, the system consists of pipe having designated diameter with the one meter length. There are caps and seals are provided to the both ends of the pipe and this whole assembly is inserted in to the water to identify the leakage easily. One end of the pipe is attached to the air pressure gauge and non return valve is provided to the other end. At this moment, both the ends of pipe undergoing testing are closed and haven't includes any leakage. As the air gets started to enter the pipe the internal pressure of the pipe goes on increasing, this pressure is recorded with the help pressure gauge. The air continues to pass to the pipe to achieve the highest amount of pressure. Afterward, due to excessive pressure pipe undergoes the failure. The noted reading of the pressure gauge is the maximum stress carrying capacity of the pipe.

CONCLUSION

This paper is totally based on the fabrication and overview of the pipe testing machine. There are variety of testing techniques are included in this paper. In addition there is addition of current work also been done. This paper provides a glance over the working and setup for pipe testing too.

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Corresponding Author

Kadam S. C.*

Student, Department of Mechanical Engineering,
Sahakar Maharshi Shankarrao Mohite Patil Institute
of Technology and Research, Akulj, Maharashtra,
India