Inspection of Structures using Drones.

1. Introduction

Visual inspection of roofs of high rise steel structured buildings from outside and underside of the roof with respect to the condition of purlins and trusses and high mast concrete. Visual inspection of steel chimneys with respect to the condition of chimney shell and their platforms. Recording of data with coordinates and elevations. Compilation of field data with respect to observed defects like corrosion, loosened bolts, twisted structural items, cracked welding joints and preparation of preliminary report.

2. Present practice of Inspection of Structure

At present all the steel structures are being visually inspected as per the predetermined frequency by climbing on to the top of the structures. The present practice is suffering with the following problems.

1. Manual inspection of high mast structures is risky, because of hidden defects which may break during inspection leading to loss of life.
2. The inner side of the roof of steel structured buildings cannot be inspected due to in accessibility.

3. Solution required:

The start-up is expected to study the present process of Visual inspection of Structures in Visakhapatnam Steel Plant and develop a suitable product using Drones or other Industry 4.0 Technology. The Solution should take care of the following points while designing.

1. The product/solution could use any of the technologies to achieve desired results. It should able to collect a wide array of visual data during inspections. For this it may be equipped with video cameras, LiDAR*, thermal imaging, photogrammetry** and location software.
2. The product/solution should able to access angles that are more difficult to access using other methods of visual inspection, which is particularly required for the inspection of larger structures.
3. The product/solution may be able to take photographs and provide location information to easily pinpoint where a defect is located on a structure.
4. Data collected by drones will be reviewed and analyzed to take informed decisions regarding structure maintenance and repairs and address deficiencies.

*LiDAR - stands for 'light detection and ranging'. An active form of remote sensing, LiDAR technology measures the distance between objects by hitting the target with a laser and analyzing the reflected light. Using these systems, scientists and professionals can investigate natural and man-made environments with both precision and flexibility.

****Photogrammetry** is the science and technology of obtaining reliable information about physical objects and the environment through the process of recording, measuring and interpreting photographic images and patterns of electromagnetic radiant imagery and other phenomena.