

Accepted Manuscript

On-rail solution for autonomous inspections in electrical substations

Bruno P.A. Silvaa, Rafael A.M. Ferreiraa, Selson C. Gomes Jr., Flavio A.R. Caladob, Roberto M. Andradea, Matheus P. Portoa

PII: S1350-4495(17)30724-7
DOI: <https://doi.org/10.1016/j.infrared.2018.01.019>
Reference: INFPHY 2477

To appear in: *Infrared Physics & Technology*

Received Date: 2 November 2017
Revised Date: 16 January 2018
Accepted Date: 16 January 2018

Please cite this article as: B.P.A. Silvaa, R.A.M. Ferreiraa, S.C. Gomes Jr., F.A.R. Caladob, R.M. Andradea, M.P. Portoa, On-rail solution for autonomous inspections in electrical substations, *Infrared Physics & Technology* (2018), doi: <https://doi.org/10.1016/j.infrared.2018.01.019>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



On-rail solution for autonomous inspections in electrical substations

Bruno P. A. Silva^a, Rafael A. M. Ferreira^a, Selson C. Gomes Jr.^a, Flavio A. R. Calado^b,
Roberto M. Andrade^a, Matheus P. Porto^a

^aPrograma de Pós Graduação em Engenharia Mecânica, UFMG

^bUNA - Centro Univesitario

Abstract

This work presents an alternative solution for autonomous inspections in electrical substations. The autonomous system is a robot that moves on rails, collects infrared and visible images of selected targets, also processes the data and predicts the components lifetime. The robot moves on rails to overcome difficulties found in not paved substations commonly encountered in Brazil. We take advantage of using rails to convey the data by them, minimizing the electromagnetic interference, and at the same time transmitting electrical energy to feed the autonomous system. As part of the quality control process, we compared thermographic inspections made by the robot with inspections made by a trained thermographer using a scientific camera Flir® SC660. The results have shown that the robot achieved satisfactory results, identifying components and measuring temperature accurately. The embodied routine considers the weather changes along the day, providing a standard result of the components thermal response, also gives the uncertainty of temperature measurement, contributing to the quality in the decision making process.

Keywords: Thermography, autonomous inspections, monitoring robot, electrical components, electrical substation.

Email addresses: bruno.phill@gmail.com (Bruno P. A. Silva), r.ferreira102@hotmail.com (Rafael A. M. Ferreira), selson.gomes@gmail.com (Selson C. Gomes Jr.), flavio.arcalado@gmail.com (Flavio A. R. Calado), roberto@demec.ufmg.br (Roberto M. Andrade), matheusporto@ufmg.br (Matheus P. Porto)

¹Laboratório de Termometria do Departamento de Engenharia Mecânica da UFMG. Programa de Pós Graduação em Engenharia Mecânica, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil

Download English Version:

<https://daneshyari.com/en/article/8145704>

Download Persian Version:

<https://daneshyari.com/article/8145704>

[Daneshyari.com](https://daneshyari.com)