Towards fault-tolerant decision support systems for ship operator guidance

Fault detection and isolation are very important elements in the design of fault-tolerant decision support systems for ship operator guidance. This study outlines remedies that can be applied for fault diagnosis, when the ship responses are assumed to be linear in the wave excitation. A novel numerical procedure is described for the calculation of residuals using the ship’s transfer functions which correlate the wave excitation and the ship responses. As tests, multiplicative faults have artificially been imposed to full-scale motion measurements and it is shown that the developed model is able to detect and isolate all faults.

General information
Publication status: Published
Organisations: Department of Mechanical Engineering, Fluid Mechanics, Coastal and Maritime Engineering, Maersk Group
Contributors: Nielsen, U. D., Lajic, Z., Jensen, J. J.
Pages: 1-14
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Reliability Engineering & System Safety
Volume: 104
ISSN (Print): 0951-8320
Ratings:
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.55 SJR 1.512 SNIP 2.962
Web of Science (2012): Impact factor 1.901
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Original language: English
Keywords: Fault diagnosis, System models, System reliability, Transfer functions, Fault-tolerant decision support systems, Sea state estimation
Electronic versions:
FaultTolerantDSS.pdf
DOIs:
10.1016/j.ress.2012.04.009
Source: dtu
Source ID: n:oat:DTIC-ART:elsevier/365742912::16936
Research output: Contribution to journal › Journal article – Annual report year: 2012 › Research › peer-review