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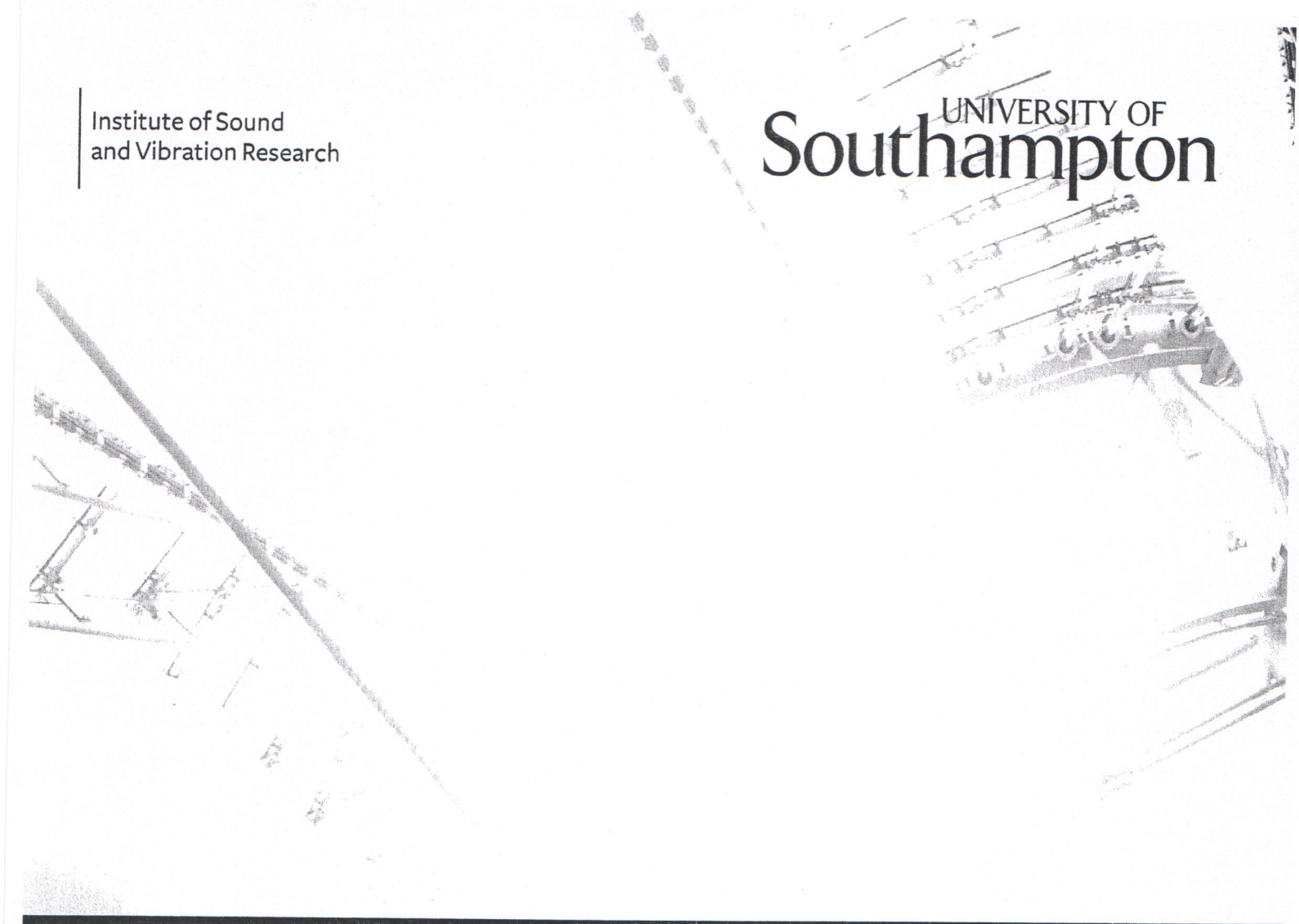

RASD2013: Recent Advances in Structural Dynamics

Proceedings of the 11th International Conference

1–3 July 2013 | Pisa, Italy

Edited by:

Emiliano Rustighi
Paola Forte
Miha Boltežar
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Proceedings of the

XI International Conference on Recent Advances in Structural Dynamics

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Pisa, Italy

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Vibroacoustics (continued...)

Structural Health Monitoring

Human Structure Interaction

Session 3 Structural Health Monitoring

10:50

Comparative Study of Damage Detection in Steel Catenary Risers (906)

Rodríguez-Rocha, R., Hernández-Abraham, V.F., Pérez-Guerrero, F. and Burbano-Bolaños, R., *Sección de Estudios de Posgrado e Investigación - ESIA-UZ, Instituto Politécnico Nacional, Mexico.*

Risers are used to transport crude oil and may require management plans and programs of structural integrity to allow a proper functioning during its design life. Through Structural Health Monitoring (SHM) damage may be detected ahead, and be confirmed by non-destructive inspection assisted by remotely operated vehicles, with the information obtained used to prevent disasters such as environmental pollution, and human and economic losses.

This paper presents a comparative study of damage detection methods processing dynamic signals. Numerical study cases were defined for a Steel Catenary Riser (SCR) installed offshore with a depth of 1800 m. Two damage cases were studied decreasing stiffness values at specific locations of the structure. Dynamic analyses were performed using commercial software that incorporates nonlinear behaviour. Three numerical methods for damage detection were applied to damage location. Results demonstrate the effectiveness of the proposed methodology to detect damage in deep-water SCRs.

Session 4 Human Structure Interaction

10:50

Lattice Tower Dynamic Performance Under Human Induced Dynamic Loading (920)

Gaile, L. and Radinsh, I., *Department of Structural Engineering, Riga Technical University, Latvia.*

The structural design of light-weight lattice observation towers intended for general public use is mostly based on previous experience and mainly considers the wind loads. The most likely reason is a lack of understanding how these structures perform dynamically under human induced walking loads. The paper presents experimentally obtained geometrical and modal parameter ranges of typical light-weight lattice observation towers and the levels of their response to human walking loads. The paper investigates the sensitivity of tower to vibration caused by various walking harmonics and loading scenarios, the influence of visitors group size on the tower response and there are proposed a tentative limit to the maximum acceleration level of structure to ensure comfort for the tower visitors.