PROJECT PROPOSALS FOR THE 2ND CALL OF FP7

(DEC 2007 – JAN 2008)

Template for the project synopsis

1. Proposal for project name:

PM 'n' IDEA (**P**redictive **M**aintenance employing **N**on-intrusive **I**nspection & **D**ata **A**nalysis

2. Problem that the project will address (why is the project being initiated?)

The project has two key drivers; firstly to contribute towards the realisation of a 24 x 7 railway by minimising the disruption caused by activities such as inspection, remedial and reactive maintenance, and track renewal. Secondly, the introduction of novel sensor and inspection technologies that focus more on the monitoring of degradation through the measurement of deviation from an identified "signature tune".

The project will address the key requirement of minimising manual inspection ("track walking") for both main line and urban transport systems. It will focus on the degradation of the key components of the track system such as insulated block joints and stretcher bars whose integrity is fundamental to satisfy the objective of 24 x 7 railway and the associated increasing in duty conditions. It will also bridge the current gap in standards for the definition and assessment of the structural integrity of grooved rail.

3. Scope of the project

In view of the commonality of the technologies and the novel approaches required, the project will encompass the requirements of both main line and urban transport systems. In particular, some of the key requirements that will be addressed within the scope of the project are:

a. Establishing the criteria for assessing the structural integrity of grooved rail sections embedded in street running sections of tramway networks. This will establish the magnitude of permissible side and vertical wear and the minimum thickness of the "keeper" part of the grooved rail. There are no current and mandatory standards for this aspect.
b. The development of an inspection system for the assessment of internal integrity of street running grooved rail sections. Again, no proven system is available for this purpose.
c. Further development and application of image acquisition and analysis techniques for as much of the track system and its environment currently inspected by manual means. This is applicable for both mainline and urban transport systems.
d. The development of methodologies to measure the deviation of track quality from identified "signature tune" of the segments. This is applicable to both mainline and urban transport systems.
e. The development of techniques for the automatic assessment of the degradation and integrity of fish plated and insulated block joints, expansion joints, switch blades, and stretcher bars. These developments are applicable to both mainline and urban transport systems.
f. Developing technologies for the measurement of rail deflection, calculation of associated stresses, and the techniques for extrapolation for other vehicle types

and loading conditions. Indirect assessment of the degradation of track stiffness will also be considered.

4. Which section of the 2nd call draft is being addressed?
    a. The project will address Section 2 of the 2nd call with particular reference to the requirement of "maintenance and end of life decisions aiming at improving the environmental impact of urban rail systems without increasing their LCC".
    b. The proposed development of the concept of the "measurement of deviation from signature tune" rather than on the absolute measurements of parameters that have traditionally been considered important, will also address the subject described in Section 5 of the 2nd call.

5. State of the art: previous or on-going research or standardisation initiatives in this area.

    The project will build on the work being done in:
    a. "Innotrack" on track/rail inspection technologies and the development of rail degradation algorithms.
    b. Eurabalt II on the assessment of track stiffness
    c. UK government sponsored undertaken by consortium lead by Corus on the use of image analysis techniques for rail surface defects and features.

6. Estimated budget (total and EC Contribution)

(Please note that under FP7 R&D activities as well as demonstration will be 50% funded)

    The target is to keep the total project budget to below 4 million Euors with 50% funding from EC

7. Project duration *(indicative range: between 24 and 48 months)*

    24 months

8. The leader of the proposal preparation

    This should be decided once the consortium membership is compiled. However, Corus hopes to take an active part either representing itself or on behalf of a tramway operations and maintenance franchisee company

9. Main potential partners (names of companies supporting the proposal as opposed to potentially interested stakeholders)
    a. Corus
    b. Stagecoach Supertram Maintenance Limited
    c. Manchester Metropolitan University
    d. Cranfield University

10. Contributions to standards – can the results of this projects be transferred into future EN standards? *(Maximum 5 lines)*

    The results of the project will help define the standards related to the maintenance of grooved embedded rails. It could also lead to the harmonisation of the techniques used for the assessment of track geometry in both main line urban transport systems.

11. Implications of the project for current individual company products and practices – is the proposal supported internally within each major partner at the strategic level?
(Maximum 5 lines)

    The background and developed IPR will be defined in the consortium agreement and agreed between the project partners.

12. Risk factors that could jeopardize the implementation of results. How to ensure market up-take and who will have the responsibility over the implementation?
(Maximum 5 lines)

    The diversity of the current track quality inspection techniques and their analysis is considered a potential hurdle to the rapid implementation of any techniques developed in this project. Similarly, the need to seek approval of newly developed technologies separately by each Infrastructure Manager is a risk to rapid implementation.