FRONZ / ONTRACK

APPROVED CODE OF PRACTISE
FOR
HERTIAGE NETWORK OPERATORS

Mechanical Code
B3.1.1.02

Engineering Change Process

Issue	Prepared (P), Reviewed (R), Amended (A)	Approved by	Effective Date
1.0	P McCallum (P)	Heritage Technical Committee	12 Dec 2006

Reference Material

Source	Description	Date

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Amendment History

Version	Section	Amendment
Draft		Released 13/01/2006
Draft 2	All	Added paragraph numbers
1	1	Added reference to the operators safety management review process and NRSS 2
	2.3	Added reference to LTNZ and Safety Auditor

Engineering Change Process

1 Introduction

An Engineering Change is defined as any alteration to a rail vehicle, item of plant or infrastructure which changes the

- Design; or
- Materials; or
- Construction methods; or
- Maintenance methods; or
- Standards and wear limits; or
- Inspection process or periods; or
- Operating procedures of a vehicle, plant or infrastructure.

Any such change may have safety or reliability consequences that are unforseen by maintenance staff.

Examples

- Riveted and welded joints react differently when stressed. Repairing riveted joints by patch welding can overstress one of the fastenings because they will not share the load evenly.
- Replacing one lubricant with another can cause premature failure or incorrect operation of a component.
- Repairing timber framing with a timber type with different properties (eg, strength, resilience, rot resistance) to the original may reduce the strength and resistance to flexing of a vehicle body.

Each operator needs to have a process for assessing and approving engineering changes. It should form part of the safety management review process included in the operator's Safety System as required by NRSS 2 – Safety Management; Section 8.3.

This code sets out the minimum requirements for an Engineering Change Process.

2 Assessment of Engineering Changes

2.1 Every operator should appoint a person ("Mechanical Assessor" or other suitable title) with sufficient knowledge and expertise to decide if a proposed change is:-

- Minor – will have no significant impact on safety, operability or reliability.
- Significant – may possibly have significant impact on safety, operability or reliability.
- Unknown – assessment of the effects of the proposed change is outside the expertise of the "Mechanical Assessor".

2.2 If the "Mechanical Assessor" is unable to assess the effects of the change then outside expertise should be sought. Eg

- Professional engineer (with railway expertise for railway specific items).
- Other rail operators who may have a recognised solution to the problem.
- Heritage Technical Committee

2.3 In assessing the impacts of a proposed change the "Mechanical Assessor" should take into account:-

- Is the change in accordance with established railway engineering practice?
- Is the change in accordance with good mechanical engineering practice?
- Does the change increase or decrease the risk level of the item being changed.

- Does the change have significant advantages (eg. safety, financial, labour, maintenance) for the operator?
- Does the change require notification and approval of the operator's Safety Auditor and / or LTNZ?

3 Approval Record

3.1 Every operator should maintain a file of approved Engineering Changes. For each change the record should contain:-

- The reason for the change.
- Who was involved in the assessment and approval of the change. Eg.
  - Operator's "Mechanical Assessor".
  - Professional railway engineer.
  - Heritage Technical Committee.
- Any reports from outside advisers.
- The risk assessment of the change (risk level of the change versus the replaced practice).
- The approved change process including
  - description and/or drawings (or photographs) of the approved change;
  - any special instructions relating to implementation of the change;
  - a statement of which vehicle(s) the change applies to.

3.1 Any approved change, which has significant impact, should be referred to the Heritage Technical Committee for comment.

4 Engineering Change Order (ECO)

To assist the operator's staff in implementing the engineering change an Engineering Change Order should be prepared which includes:-

- Description and/or drawings (or photographs) of the approved change;
- Any special instructions relating to implementation of the change;
- A statement of which vehicle(s) the change applies to.
- The urgency of the change (eg. ASAP, next annual maintenance, at major overhaul, not essential)

5 Vehicle Records

The maintenance record of each vehicle (or plant item) which has had an engineering change should be endorsed with:-

- The ECO file reference.
- Brief description of the work carried out.
- Date of completion.
- Person undertaken the work.
- Person inspecting the work.