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# QUALITY

## Incident Investigation and Quality Incident Event Process (QIEP) Procedure

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**Revision Changes:**

Revision	Status / Description of Changes
1.0	For Implementation
2.0	General update to reflect: <ul style="list-style-type: none"> <li>• Changes to addresses and organisation (Section 4).</li> <li>• References added to the Principal Delivery Engineer (PDE) throughout document.</li> <li>• Section 6.3 - to include use of Contractor's presentation and Root Cause analysis.</li> <li>• Section 6.4 - Escalation of NCRs at the earliest opportunity.</li> <li>• Section 6.4 - Supervisor added to quorum of QIEP Panel.</li> <li>• Section 4 - Definition of QIEP NCR's added and reflected throughout document</li> <li>• Removal of Category 1 Non Conformance Report</li> </ul>
3.0	<ul style="list-style-type: none"> <li>• Addition of the requirement to notify the IM upon the discovery of a QIEP NCR.</li> <li>• Reference made to RfLi and LU investigation procedure</li> <li>• Definitions added for IM and IM representative</li> <li>• QIEP Flowchart updated</li> </ul>

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## 1 Introduction

While it is Crossrail’s belief that all Non-conformances (NCRs) are preventable, in the event QIEP NCR’s do occur, this procedure has been developed to ensure that lessons can be learned and that they can be prevented in the future.

## 2 Purpose

This procedure forms part of the Crossrail Management System (CMS) and demonstrates the processes in place to ensure that QIEP NCRs are appropriately investigated, in line with legal requirements and best practice. This procedure should also be read in conjunction with the Project Technical Requests (RFI, FCD, NCR) Procedure [Ref 1] in the Reference Documents section 7.0 of this procedure.

## 3 Scope

This procedure is applicable to QIEP NCRs involving:

- Crossrail Employees (including those that work for Crossrail’s Project Delivery Partners),
- Crossrail Limited controlled premises,
- Contractors engaged by Crossrail Limited.

## 4 Definitions

<b>Responsible Director</b>	Crossrail Director / Functional Director as appropriate depending on the nature and location of incident.
<b>The Crossrail Team</b>	The integrated team comprising Crossrail Ltd direct employees, temporary staff, seconded staff, and staff provided by the Programme Partners and Project Delivery Partners.
<b>Crossrail Limited Locations</b>	Locations where Crossrail Limited is responsible for the day-to-day management of the location, e.g. 5 Endeavour Square, Liverpool Street offices and site offices under the control of the Project Manager.
<b>Category 1 NCR (CAT 1 NCR)</b>	NCR with an estimated cost of rework over £60,000 and / or an NCR which could have safety implications.
<b>Category 2 NCR’s</b>	NCR with an estimated cost of rework between £6,000 and £60,000 and Recurring Cat 3 NCRs
<b>Infrastructure Manager (IM)</b>	<p>“infrastructure manager” means the person who—</p> <p>(a) in relation to infrastructure other than a station, is responsible for developing and maintaining that infrastructure or, in relation to a station, the person who is responsible for managing and operating that station, except that it shall not include any person solely on the basis that he carries out the construction of that infrastructure or station or its maintenance, repair or alteration; and</p> <p>(b) manages and uses that infrastructure or station, or permits it to be used, for the operation of a vehicle.</p>
<b>IM Representative</b>	<p>The representatives from RfLi and LU which include the following roles:</p> <p>RfLi Quality Manager</p> <p>RfLi Head of Engineering</p> <p>PE - Principal Project Engineering - LUCT</p>

<b>LUCT</b>	London Underground Crossrail Team
<b>LUL</b>	London Underground Limited
<b>Non Conformance Report (NCR)</b>	A report that defines and documents a non-conformance (non-fulfilment of a requirement) and provides a disposition and documentation of the resolution.
<b>Quality Incident Event Process (QIEP)</b>	A process, invoked for specific incidents, involving Senior Management / Directors from Crossrail and its Contractors to discuss the parameters of a CAT 1 NCR incident investigation. The QIEP process seeks to ensure that all root causes are established and that corrective actions can be addressed and preventive actions put in place to avoid repetition.
<b>QIEP NCR's</b>	<ul style="list-style-type: none"> <li>• CAT 1 NCRs</li> <li>• Potential/suspected CAT 1 NCR's</li> <li>• NCR's with a major safety risk, or</li> <li>• A number of recurring CAT 2 NCRs that are causing concern due to their frequency.</li> </ul>
<b>(QIEP) Panel</b>	A group of senior representatives from Crossrail and the Principal Contractor that co-ordinates an appropriate Root Cause Analysis for all CAT 1 incidents.
<b>RfLi</b>	Rail for London Infrastructure
<b>Spot-On</b>	<b>Specific Problem Obstacle Tool - On Non-conformances.</b> <i>Spot-On</i> is a tool used to resolve NCRs through intensive discussion, process mapping and brainstorming to determine the root cause of an NCR.
<b>SPOT-On champion</b>	The <i>SPOT-On</i> champion (e.g.. Quality Manager) will co-ordinate and facilitate the overall <i>SPOT-On</i> process ensuring that they are completed effectively.

## 5 Responsibilities

The Project Managers are responsible for the implementation of this procedure for Quality QIEP NCRs,

The appropriate *Responsible Director* has overall responsibility to ensure a QIEP NCR incident investigation is undertaken within their respective directorate.

The Programme Quality Manager is responsible for maintaining this procedure and ensuring it is communicated effectively.

## 6 Procedure

### 6.1 Technical Support

Technical support for incident investigations is available for all QIEP NCRs:

This support will include:

- Providing assistance in the development of incident investigation root cause analysis;
- Providing competent individuals to assist in the investigation;
- Arranging for investigation of QIEP NCRs to be undertaken by individuals independent from Crossrail where required;
- Collating, analysing and reporting QIEP NCR data, trends and strategic actions.

## 6.2 Non-conformance Category

NCR Category	Category Definition	Solution Methodology	Resource	Responsibility	Example
1	> £60k and/ or Major Safety Risk Potential and Recurring Cat 2 NCRs	Full SPOT-on process	Team	Contractor Individual Responsible for element of works (e.g. Construction Manager) or other Nominated Competent Person	Failure of a main structural member that causes significant programme delays and / or potential to cause harm.
2	£6k - £60k and Recurring Cat 3 NCRs	RCA Tools (e.g. 5 Why's, fishbone)	Team/ Individual	Contractor Individual Responsible for element of works (e.g. Construction Manager) or other Nominated Competent Person	Installed Structural steelwork members without welding procedure specification and NDT testing results.
3	£3k - £6k and Recurring Cat 4 NCRs	RCA Tools (e.g. 5 Why's)	Individual	Contractor Nominated Competent Person (e.g. Section Engineer)	Couplers out of position due to incorrect setting out / measurement and is a recurring issue.
4	£500 - £3k	RCA Tools (e.g. 5 Why's)	Individual	Contractor Nominated Competent Person (e.g. Section Engineer)	Minor concrete finish defects such as blow holes.

## 6.3 Non-conformance Reports

An NCR is a reporting mechanism for a non-conformance in a part of the works, activity or process that does not conform to the Works Information.

The standard work process for initiating, routing, responding to and closing out NCRs is included in **Appendix 2 – Work Flow Process**.

Refer to (QIEP) Cat 1 NCR - Incident Investigation Report [Ref A] for the correct form to complete, see the Standard Forms and Templates section 8.0 of this procedure. In some cases if agreed with the Head of Quality, the contractor's presentation and Root Cause Analysis (RCA) may be used to capture the salient points of the form to prevent duplication.

### 6.3.1 Examples of NCRs

- Permanent works items that are nonconforming or indeterminate and cannot be completed or reworked prior to final acceptance.
- Documentation (or lack thereof) that renders a permanent works item to be nonconforming.
- Procedure violations that render a permanent works item to be nonconforming and indeterminate.
- Material compliance or traceability issues including material type, identification or quality.

**See further notes in Appendix 1**

## **6.4 Quality Incident Event Process (QIEP)**

A QIEP NCR incident must be reported by the *Supervisor Rep (PFE) / Principal Delivery Engineer* to the Project Manager and IM representative immediately and a (QIEP) Cat 1 NCR - Incident Investigation Report [Ref A] raised. A decision will be made by the IM Representative as to which organisation will lead the investigation for QIEP NCR's for handed over work packages. In this scenario, "Deciding the Lead Organisation and Level of Investigation" [Ref 4] will be followed for RfLi scope and "Incident reporting and local investigation" [Ref 5] will be followed for LU scope. Note: [Ref 6] and [Ref 7] provides templates used by LU covering the guide to completing formal investigations along with the template used for compiling the formal investigation report.

It is recognised that some NCR's are not "clear cut" and as such, these should be escalated as soon as practicable.

All information must be processed in eB PTR immediately.

Once the immediate factors relating to the incident have been dealt with by the appropriate response team, the Project Manager should instigate a (QIEP) as detailed below. This procedure requires the formation of a QIEP Panel which should consist of:

- Technical Director (Optional),
- IM Representative (Optional)
- Supervisor (Optional),
- The appropriate *Responsible Director*,
- The Project Manager,
- Crossrail Head of Quality,
- The appropriate Crossrail Quality Manager,
- The appropriate Crossrail Quality Engineer,
- The Supervisors Rep (PFE) / Principal Delivery Engineer,
- A senior management representative from the Principal Contractor (Managing Director or Project Director),
- A member of the Principal Contractor's Quality team and
- Any other appropriate person deemed necessary by the Project Manager.

This procedure has been developed to ensure that, following a QIEP NCR, an appropriate and robust investigation shall be undertaken to ascertain all required facts and root causes of the incident.

The (QIEP) process will be instigated by a Project Manager when he/she notifies the *Responsible Director* and the IM Representative of a QIEP NCR. The *Responsible Director* will chair the review for all confirmed *QIEP NCR's*. If necessary, a decision to complete a (QIEP) review should be made between the *Responsible Director*, IM Representative and the Head of Quality.

The actual (QIEP) shall be conducted by the senior management representative (Managing Director or Project Director) from the Principal Contractor. The QIEP is a three part process looking at both the Terms of Reference of an investigation and the investigation itself. For this the (QIEP) Cat 1 NCR - Incident Investigation Report [Ref A] shall be used. By exception, all parts of the review should be completed within 2 weeks of the incident. While a 14 day (QIEP) / Incident closure is envisaged, it is recognised that each event is unique and it therefore may be appropriate to extend the time in which an incident should be closed-out and, if necessary, update the (QIEP) Cat 1 NCR - Incident Investigation Report [Ref A] template to suit the incident. However, the general principles outlined below shall be followed:

The QIEP Process Flow Chart is included as **Appendix 3 – QIEP Process Flow Chart**.

**Part 1: CAT 1 NCR review (preferably within 24 hours/as soon as practicable)**

As soon as practical after an incident has been identified as triggering the (QIEP) process, a meeting shall be held with an established (*QIEP*) *Panel*. The intention is for information to be shared about the incident and for all to determine the following:

- Full details of the incident.
- Any controls that might have failed leading to the incident that may need to be communicated more widely across Crossrail.
- Confirm that necessary immediate steps have been taken to prevent further issues.
- Confirm that necessary immediate steps have been taken to enable work to restart.
- Confirm that an adequate investigation Terms of Reference has been set and if necessary to insist on other elements to be considered as part of the *Spot-On* or equivalent process.
- Confirm that adequate resources have been made available to complete the investigation and agree timescales for its completion.

This meeting may take place via a telephone conference but for more serious incidents it is expected that a face to face meeting takes place.

**Part 2: Investigation / Lessons Review**

On completion of the *Spot-On* or equivalent investigation (Refer to *Spot-On* definition – Section 4.0 and *Spot-On* Template – Section 8.0 [Ref B]). The Principal Contractor will be invited to present the findings to the *Responsible Director* and the Head of Quality. The purpose of this presentation is to:

- Ensure a clear understanding of the investigation findings.
- Confirm that the investigation has been completed to a satisfactory standard.
- Confirm that any resultant actions have been adequately resourced to be achieved within acceptable timescales and
- Agree any follow up actions that may be required both for the contracting organisation and throughout Crossrail.
- Confirm the Crossrail time and cost implications of conducting the review.

It may be necessary to hold an interim review if the investigation or its report is not completed within the required timescale or where additional information is received which substantially changes the understanding of the circumstances or consequences of the incident.

Where it is identified that lessons may be learnt from a Quality QIEP NCR, sufficient details of the NCR should be forwarded to [REDACTED] who will then produce a Quality Alert. This can be produced in line with the Quality Alerts Guidance Note – Section 7.0 [Ref 3]. Where lessons can be learned from other incident types, then the appropriate *Responsible Director* should make contact directly with the relevant department.



**Part 3: Review of Actions and Incident Closure**

On completion of the actions the Crossrail Project Manager / *Responsible Director* will ensure that the Quality Incident Event Process is completed and the investigation report is shared between appropriate representatives.

All elements of the (QIEP) should be recorded on the (QIEP) Cat 1 NCR - Incident Investigation Report [Ref A] which should reference the completed *SPOT-On* Template [Ref B]. These documents should be uploaded within eB and linked to the NCR.

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## 7 Reference Documents

Ref:	Document Title:	Document Number:
1	Project Technical Request (RFI-NCR-FCD) Procedure	CRL1-XRL-Z-GPD-CR001-50006
2	Non-Conformity, Corrective & Preventive Action Procedure	CRL1-XRL-O4-GPD-CR001-50026
3	Quality Alerts Guidance Note	CRL1-XRL-O4-GUI-CR001-50018
4	Deciding the Lead Organisation and Level of Investigation	CRL1-RFL-Z7-STD-CR001-50022 RFLI-GEN-HS-SDD-0007 (RFLi No)
5	Incident reporting and local investigation	S5557 (LU Reference Number)
6	Guide to completing a Formal Investigation Report template	G2121 (LU Reference Number)
7	Formal investigation report template	F5712 (LU Reference Number)

## 8 Standard Forms and Templates

Ref:	Document Title:	Document Number:
A	(QIEP) Cat 1 NCR - Incident Investigation Report	CRL1-XRL-O4-ZTM-CR001-50039
B	SPOT-On Template	CRL1-XRL-O4-ZFM-CR001-50017

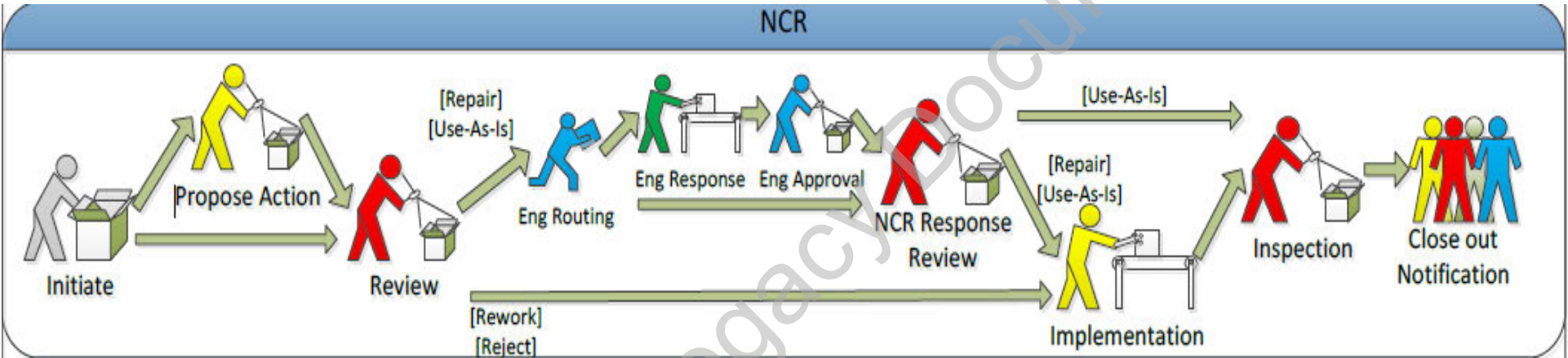
## **9 Appendices**

### **Appendix 1 - Notes**

- Include only one specific subject per NCR;
- Ensure NCRs are legible and contain all necessary information required for evaluation;
- Ensure referenced documentation is accessible by all parties to the project and eB relationships are created;
- *The Contractor* is required to evaluate the cause of each NCR and determine whether the non-conformance is a unique occurrence (non-trendable) or has the potential for recurrence (trendable). *The Contractor* shall then initiate appropriate corrective action to prevent recurrence on the NCR as applicable;
- *The Supervisor Rep (PFE) / Principal Delivery Engineer* shall ensure a report is completed for QIEP NCRs using the (QIEP) Cat 1 NCR - Incident Investigation Report [Ref A] in the Standard Forms and Templates section 8.0 of this procedure.
- *Supervisor Rep (PFE) / Principal Delivery Engineer* shall notify the Project Manager (within 24 hours/as soon as practicable) of any *QIEP NCR's*.
- The PM shall decide if the cost of rectification shall be allowable under the terms of the Contract;
- When disposition of NCR was Rework or Repair, the *Supervisor Rep (PFE) / Principal Delivery Engineer* shall not close out CAT 1 NCRs if there is no evidence of successful resolution attached to that NCR;
- For CAT 1 or recurring CAT 2 NCRs specified in the table under section 6.2 Non-conformance Category, *Spot-On* Root Cause Analysis (or equivalent) tools should be utilised by the *Contractor* to identify the root causes and develop action plans to prevent reoccurrence. The *SPOT-On* Template [Ref B] in the Standard Forms and Templates section of this procedure shall be used for this.

Appendix 2 – Work Flow Process

NCR information to be added to Project Technical Request (PTR) System.



**Appendix 3 – QIEP Process Flow Chart**

