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Issued By: Thameslink Programme, HSEA Team, James Forbes House, 27 Great Suffolk Street, London SE1 0NS

Issue Number: TLP 029**Title:** London Bridge – Rebar Bending Machine (15th January 2015)

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Overview of Event:

Whilst operating an electrically powered rebar bending machine an operative sustained a minor injury to his wrist when he was struck by a length of 40mm diameter rebar. Whilst the injury was minor the Thameslink Programme treated the event as significant due to the potential of a more significant injury.

Underlying Causes:

The immediate cause is that the rebar being bent in the bar bending machine rode up the roller and struck the IP.

The root cause of the accident is the design of the equipment. These deficiencies and other underlying causes, both significant and contributory include:

- Design – significant height difference between the 40mm dia. rebar and the bed or surface of the turntable.
- Design – the run-off side of the turntable is not level with the rebar as it leaves the former (roller).
- Design – the design of the small roller does not incorporate a means of captivation
- Design – guarding is not fitting to protect the operator from moving parts
- Design / Operation – the IP used his hand to guide the rebar as it left the former (roller)
- Operation – the IP routinely used the emergency stop and reverse controls to gain (perceived) better control
- Briefing / Training – none of the briefings adequately covered the operation of the machine and there was no evidence of training for anyone on the use of the machine
- Procedure – there was no procedure on the use of the bending machine. The manual available did not provide clear operation instructions.
- Organisation – the risk of using the machine had not been assessed and there was no clear arrangements for PUWER inspections for the machine
- Communication / change management: the decision to bend the rebar was not adequately assessed by the on-site team (note: almost all of the rebar used on the project arrives pre-bent)

Actions Taken As a Result of Investigation:

- The machine was taken out of service and modifications made by the manufacturer to provide a means of captivation as well as other aspects identified in the investigation and noted above.
- The working area was re-designed to permit only authorised persons to be near the operation of the machine and incorporated isolation switches.
- A standard operating procedure was written and used to train / brief users who are to be deemed 'authorised to use' the machine.
- PUWER requirements reviewed for the site.
- The site team were briefed on the event and findings / actions.

Diagram/Photo: Bending machine after modifications**General Key Messages:**

- Plant, machinery and equipment should come with appropriate manuals / operation instructions and the design features considered, to understand if the design is effective and allows safe use.
- Operatives must be trained and competent in the equipment they are required to use as part of the job role / task
- Make sure suitable positioning of the body in relation to the equipment / tools in use is maintained at all times
- Inspection regimes should be in place for equipment