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One supervisor, two lifts: the staffing question executives ask wrongly

After a serious event, the request is for more people or more cameras. Research offers no ratio to judge it by. A better question takes fifteen minutes of one morning to explain.

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A request reaches the executive committee. The site wants another supervisor, or another observer, or cameras on both cranes. Someone asks what the right number of safety people is for a site of this size.

It is a fair question with no answer. We looked for the research and found very little.

What the research says

The UK regulator commissioned a staffing method for process plants in 2001. It is still the regulator's reference. It tests whether a team can detect, diagnose and recover from defined abnormal events in time. Its authors state that it is not designed to calculate a minimum or optimum number of staff.

The one construction study we found surveyed safety personnel in US firms. It reports that firms employ more safety staff than cross-industry guides suggest. That describes practice. Riskier projects may hire more advisers precisely because they are riskier, so a ratio taken from a survey cannot be read as a cause.

We found no controlled study linking a staffing level to serious-injury outcomes in construction or mining.

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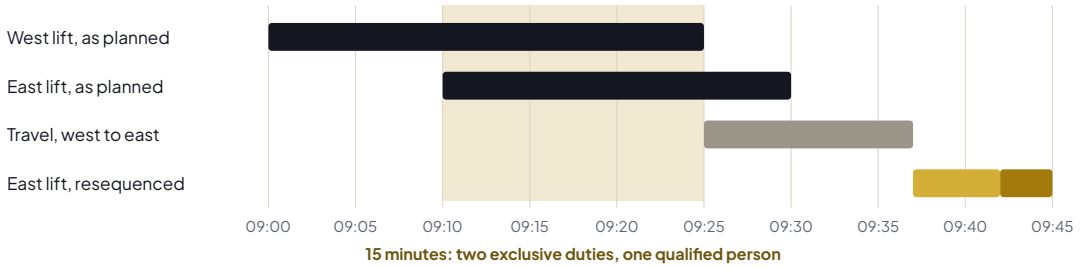
EXHIBIT



15 minutes: two exclusive duties, one qualified person

Grey: 12 minutes of travel. Light gold: 5-minute briefing from 09:37. Dark gold: earliest safe start of the east lift, 09:42. All times invented.

Fifteen minutes on an invented morning

Take a building site with two crane lifts planned before ten o'clock. Each needs the exclusive attention of a supervisor authorised to release the load. The site has one such person. A safety adviser is also present, with no authority to release a lift.

The west lift runs from 09:00 to 09:25. The east lift runs from 09:10 to 09:30. From 09:10 to 09:25, one qualified person owes two exclusive duties at once. The weekly headcount will never show those fifteen minutes.

There are three ways out, and they cost different things.

Sequence the work. The supervisor finishes the west lift at 09:25. The walk takes twelve minutes, so arrival is at 09:37. A five-minute briefing makes 09:42 the earliest honest start. A plan that says 09:40 has already failed.

Add qualified cover. A second authorised supervisor takes the east lift. This settles the conflict over one person. It does not show that two lifts can safely run at once.

Remove the overlap. Change the delivery sequence so the east lift happens at another stage.

A camera on each crane appears in none of the three. It would show two areas and leave one person owing two immediate decisions.

Texas City, read as a roster

The 2005 explosion at the Texas City refinery killed 15 people and injured 180. The US Chemical Safety Board's report is usually cited for process safety. Its staffing record deserves the same attention.

During the start-up, one board operator was responsible for three units. An earlier assessment had recommended a second board operator for start-ups, and none was assigned. The operators had worked 12-hour shifts for 29 or more consecutive days. At 10:47 the supervisor left the site for a family emergency. No supervisor or technically trained person replaced him. The explosion came at about 13:20.

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The report does not show that one more operator would have prevented it. It shows that the people who could have noticed were fewer, more tired and less supervised than the company's own assessment advised. Each of those gaps began with a decision taken away from the control room.

The question to ask instead

For any request to add a supervisor, an observer or a camera, and for any proposal to remove one, ask for three things.

- **The protective duty that is uncovered.** Named by task, place and shift.
- **Its deadline.** How long before someone is exposed.
- **The person with authority to act.** And the deputy.

The answer decides what to fund. An uncovered duty needs a qualified person. An avoidable overlap needs resequencing. Exposure that would remain under perfect observation needs redesign. A hazard seen in time by someone not entitled to act needs delegated authority. A restriction held correctly while parts are awaited needs maintenance money. Only a hazard nobody could have seen is a visibility problem.

The strongest objections to this article

"Sometimes the answer really is more people." Yes. The first case above is exactly that. The objection is to hiring before knowing which duty the new person will hold.

"This is planning overhead for sites that are already stretched." The review is done by planners and the technical authority, on one shift, for the busiest interval. A site that finds nothing has lost a few days.

"One case and one invented morning prove nothing." They prove nothing about how often this happens. They show a gap that can be looked for before anything goes wrong.

"Regulators and clients ask for ratios." Meet them. A contractual ratio is a floor, and it says nothing about whether the 09:10 lift is covered.

What would change our view

A controlled study linking a staffing level to serious-injury outcomes in our industries. If one appears, the review should start from its numbers.

Until then, count duties before you count people.

> **Read the full report.** *Who can act in time: leadership, staffing and authority behind critical controls* is published by Riskopilot Research on Riskolabs.

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Sources

1. Brabazon, P. and Conlin, H. (2001). Assessing the safety of staffing arrangements for process operations in the chemical and allied industries. Contract Research Report 348/2001, for the UK Health and Safety Executive. Listed as reference guidance on the regulator's staffing levels page.
2. Awolusi, I., Marks, E. and Vereen, S. (2017). Qualifications and staffing requirements of safety personnel in construction. *Practice Periodical on Structural Design and Construction* 22(4). ASCE Library. Abstract read. Single source.
3. US Chemical Safety and Hazard Investigation Board (2007). Refinery explosion and fire, BP Texas City. Report 2005-04-I-TX.

The lift example is invented and its times were recomputed when this article was built. The duty-coverage review is a Riskopilot proposal and has not been validated against injury outcomes. Nothing here is engineering or legal advice.

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