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The Eleventh Week

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Vigilance data from eleven-week isolated rotations at Station LOWFIELD. Attention does not decline smoothly; it declines in a step, and the step is not where anyone expected.

BACKGROUND

Station LOWFIELD operates on eleven-week rotations. Crews of four are isolated for the duration, with intermittent communications and no possibility of relief. The rotation length was set in 1986 on logistical grounds -- it is the interval the resupply schedule permits -- and has never been chosen for any reason relating to the people doing it.

This brief reports eighteen years of vigilance and error data from those rotations.

FINDING

Performance on monitored tasks does not decline gradually across a rotation.

It is flat, within noise, for the first six to seven weeks. It then declines in a step -- not a slope -- most commonly during week eight, and does not recover for the remainder of the rotation. The step is large: a 3.1x increase in missed-detection rate on the standing monitoring task, sustained.

Self-assessment does not track it. Crew members rate their own alertness essentially unchanged before and after the step. They are not concealing anything; they cannot see it.

WHAT THE STEP IS NOT

- Not sleep. Actigraphy shows no corresponding change. Crews sleeping well cross the step on schedule.

- Not workload. The step appears in light and heavy rotations alike, and the light rotations cross it slightly earlier.
- Not season. Winter and summer rotations are indistinguishable, which surprised us and eliminated the explanation most people offer first.
- Not the individual. The same person crosses the step at close to the same point on repeat rotations, but different people cross at different points -- the timing is personal and stable, which is a stranger result than either a universal constant or random variation.

WHAT APPEARS TO MATTER

The strongest correlate is novelty exhaustion: the point at which a crew member has encountered every state the station normally produces and stops receiving new information from their environment.

Crews on rotations that included an unplanned event -- an equipment failure, a weather closure, an unscheduled visitor -- crossed the step measurably later, and in three cases did not cross it at all.

We are cautious about this. It is a correlation, the events are by definition uncontrolled, and "give people a crisis" is not an operational recommendation.

RECOMMENDATIONS

- 1. Rotation length should be an ergonomic decision, not a logistical one. Eleven weeks is two to three weeks past the step for most crew.
- 2. Monitoring tasks should not be the sole detection path in the back half of a rotation. Instrument corroboration should carry weight that a human observer is, at that point, demonstrably not able to.
- 3. Self-assessment should not be used to gate safety-relevant duty. It does not track the effect and crews cannot be asked to report something they cannot perceive.
- 4. Deliberate novelty is worth studying properly, under conditions that do not require something to go wrong.

STATUS

Recommendation 2 was implemented at LOWFIELD in 2022 and contributed to the corroboration requirements now carried by Argus.

Recommendation 1 is unresolved and is, candidly, blocked on the resupply schedule that set the interval in 1986. The institution notes the irony that a number chosen for the convenience of a boat has governed human attention for thirty-nine years.

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