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Workforce Management Strategies in a Disaster Scenario

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Current Disaster Operations

- Workers
  - Dispatched from across the country through mutual assistance agreements
  - Typically inadequate for the damage sustained
  - 12, 14, 16 hour days not uncommon
  - May be housed several hours from worksite
  - May work many days consecutively with no break
- Restoration Priorities
  - Restore service as quickly as possible – priority locations take precedent
  - Ideally balance with cost –seem to be at odds

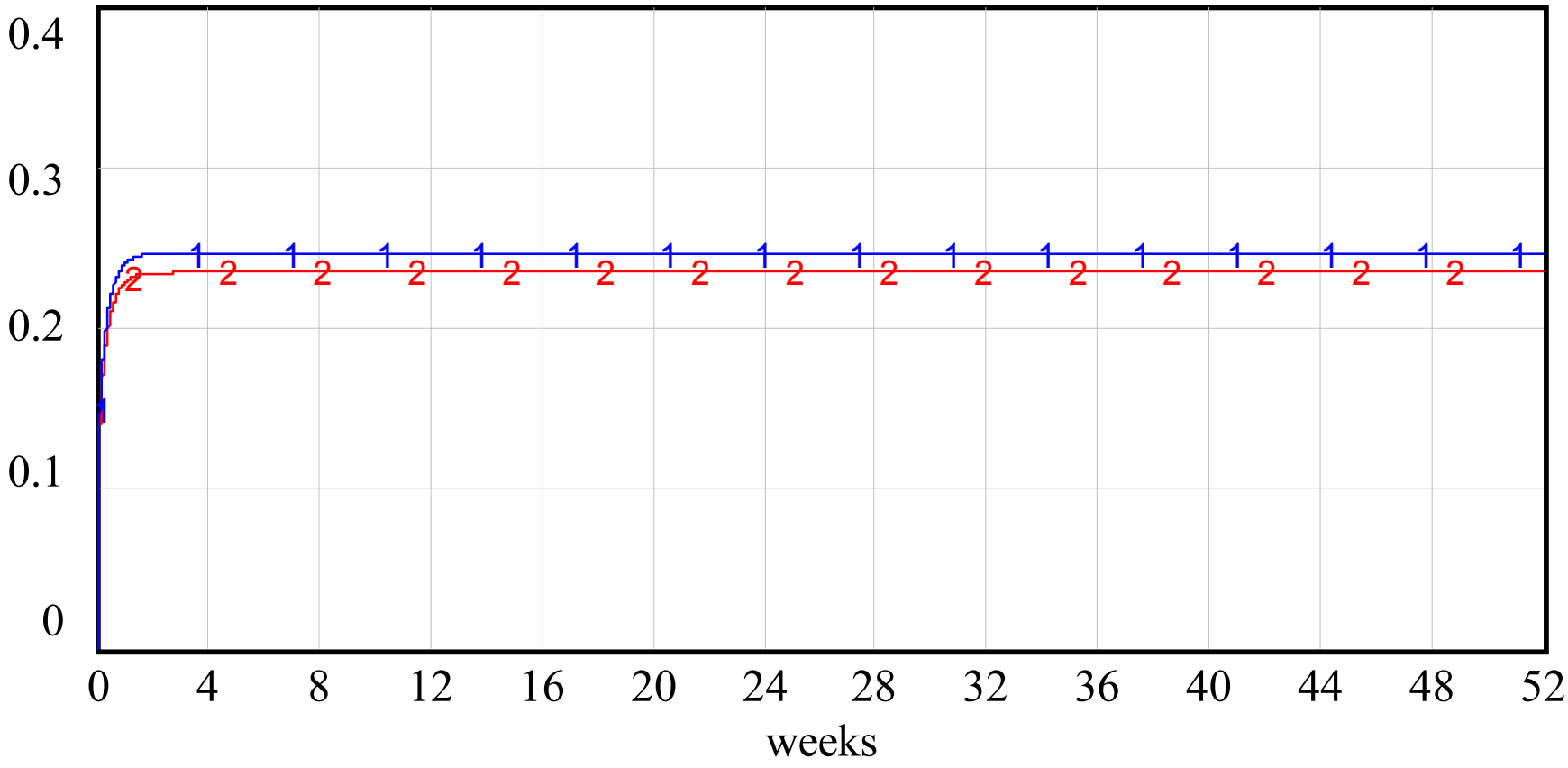
Elements of Workforce Study

- Telecommunications operations model
  - Developed in partnership with industry
- Fatigue function (Sterman/Oliva)
- Turn off routine damage
- Break the network far beyond repair
  - one million lines in a six million line network
- Test

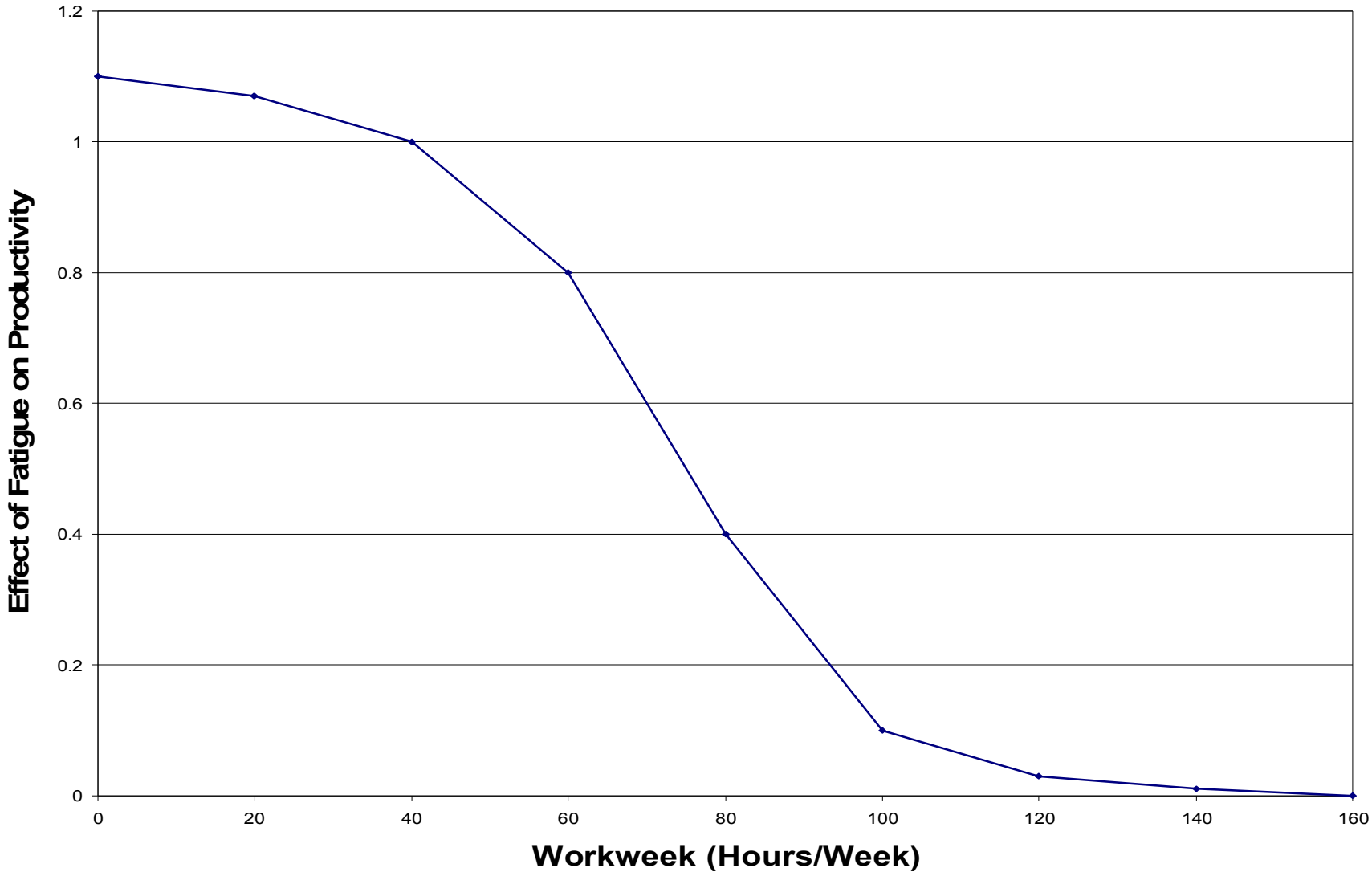
Is There a Better Mouse Trap?

- What impact does fatigue have on productivity of repair workers?
- How does working a complete double shift impact repairs?
- Does a shorter shift impact repairs?
- What shift profile is the most effective?
- Can cost and repair time be balanced?

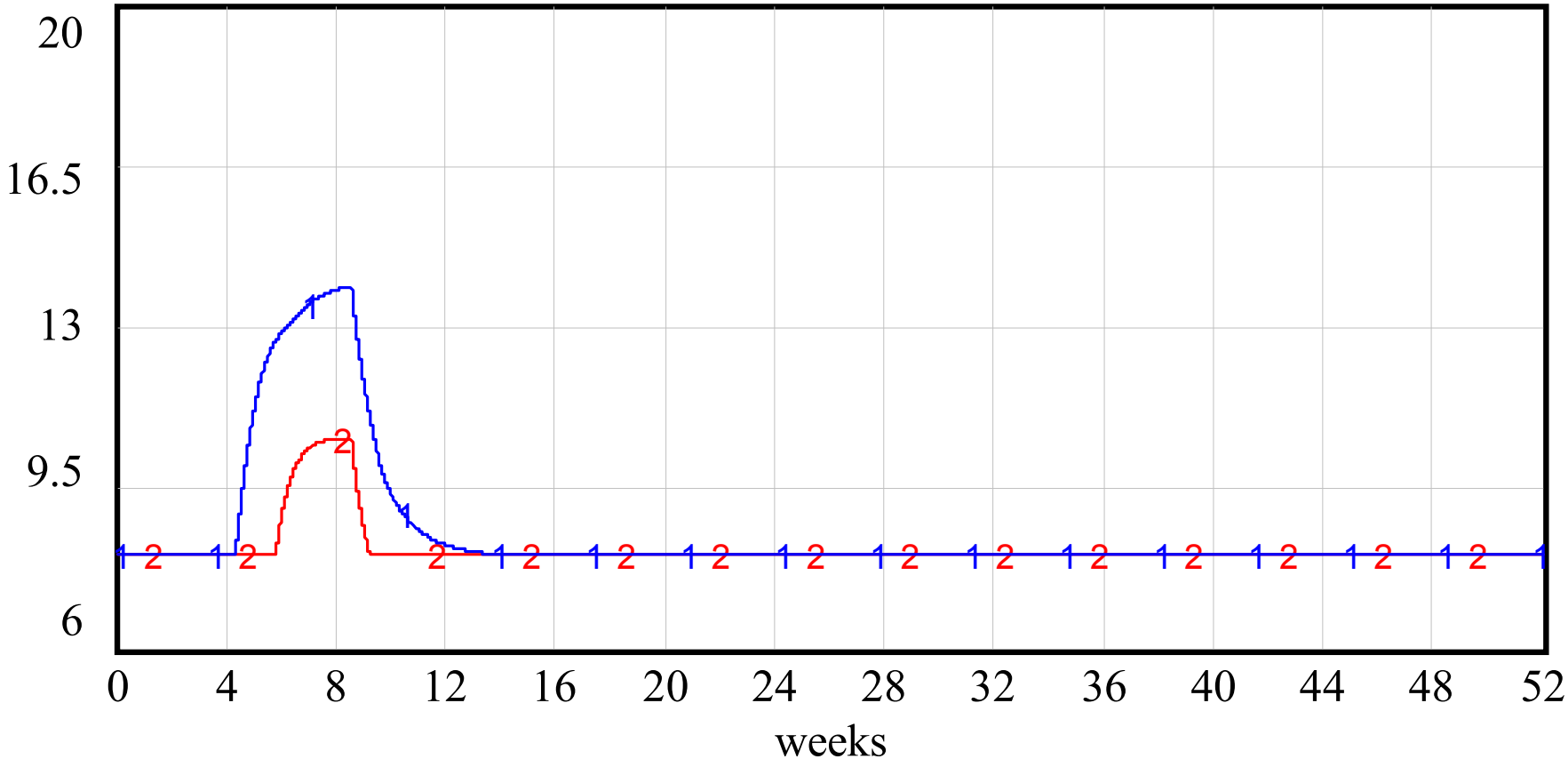
Percent Network Damaged



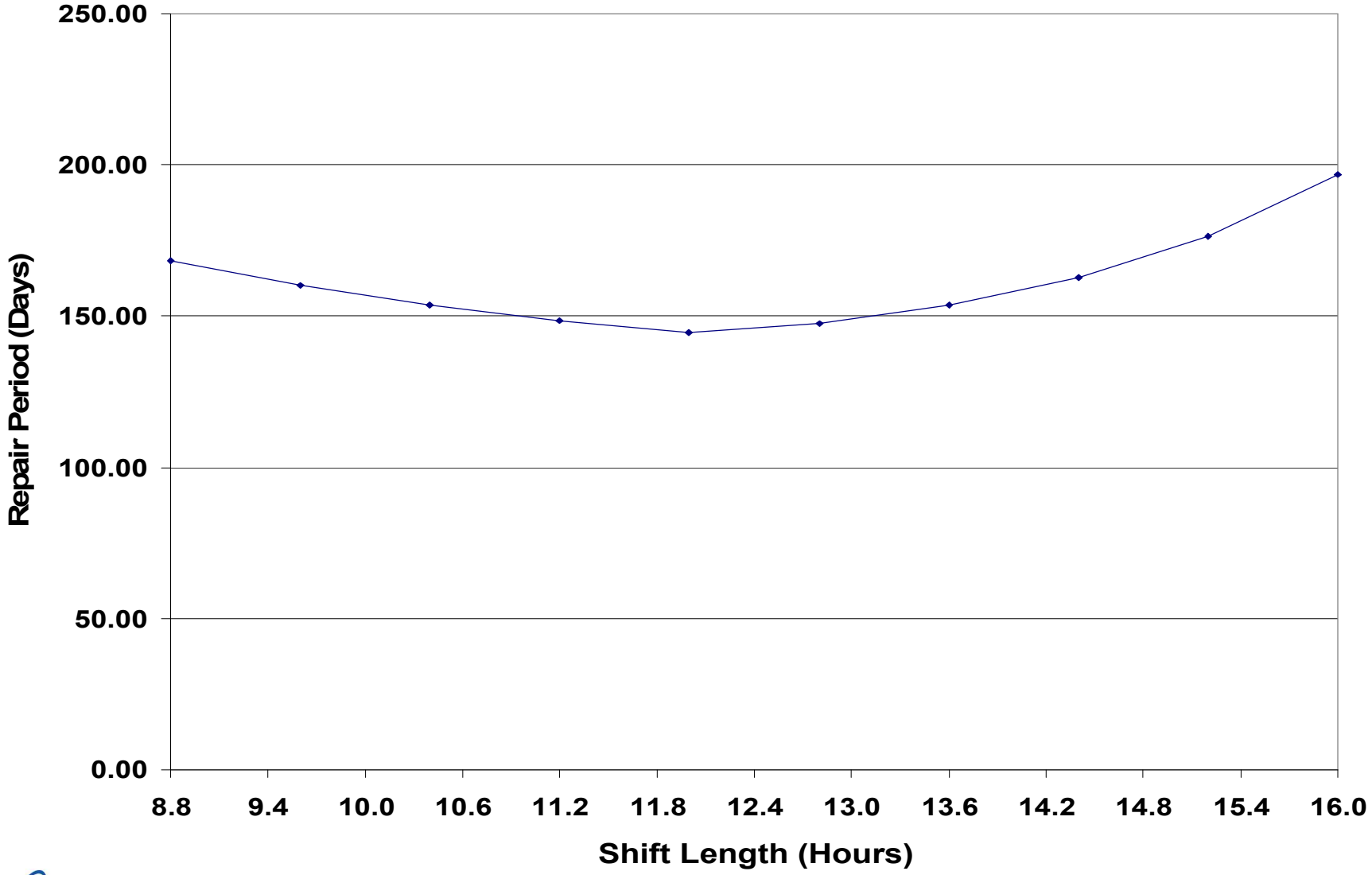
Effect of Fatigue on Productivity



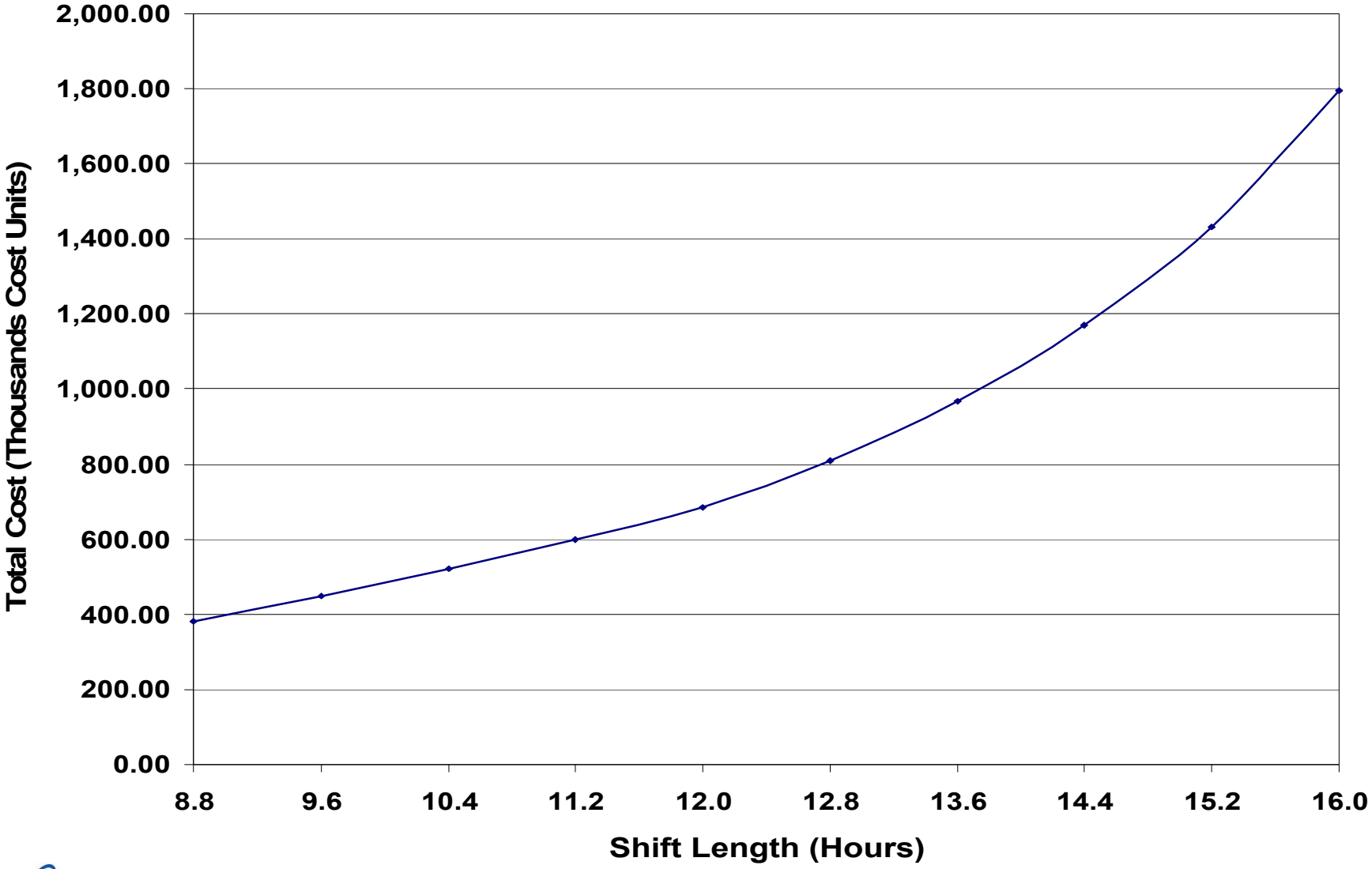
Fatigue – Current Operations



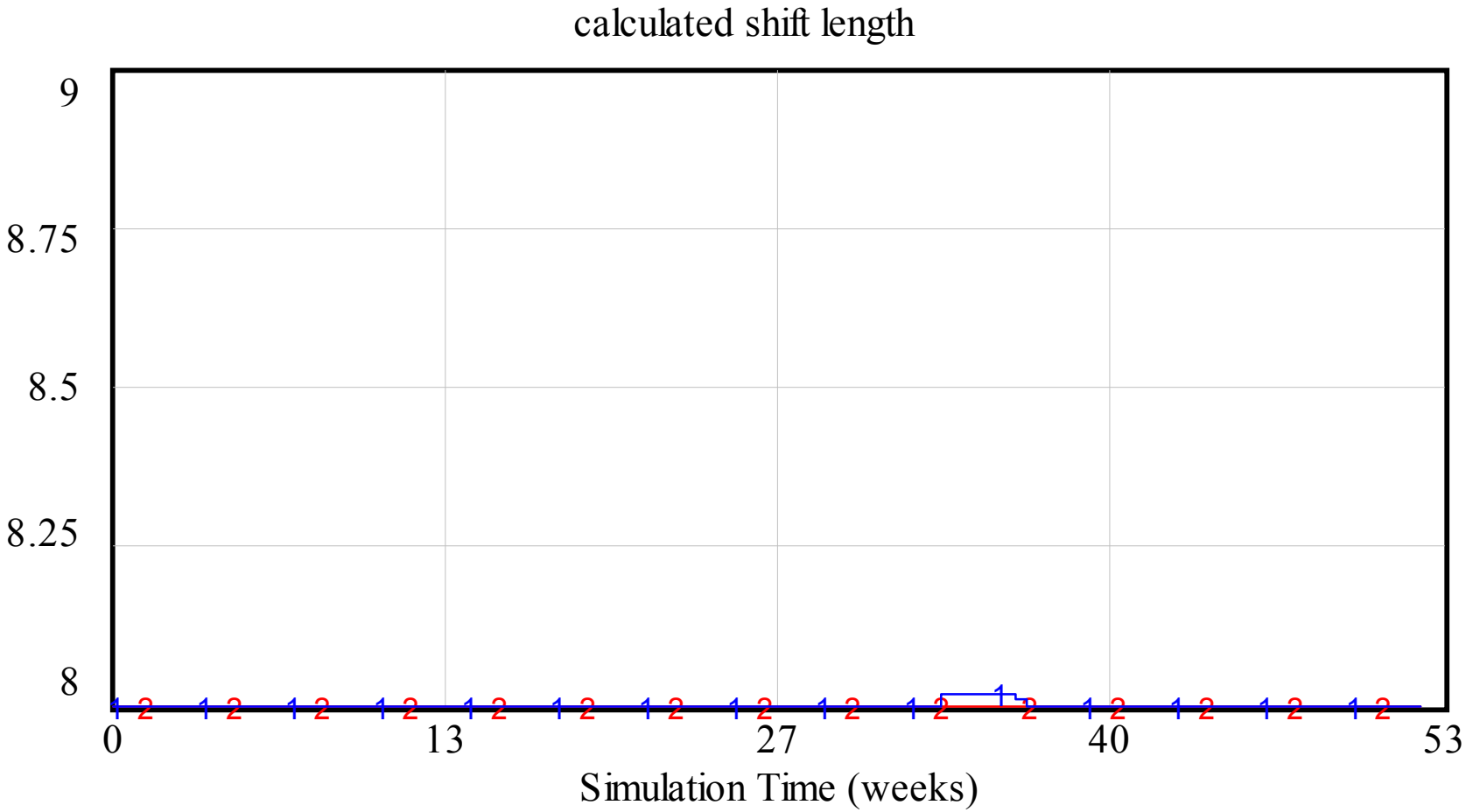
Repair Time Duration vs Shift Length



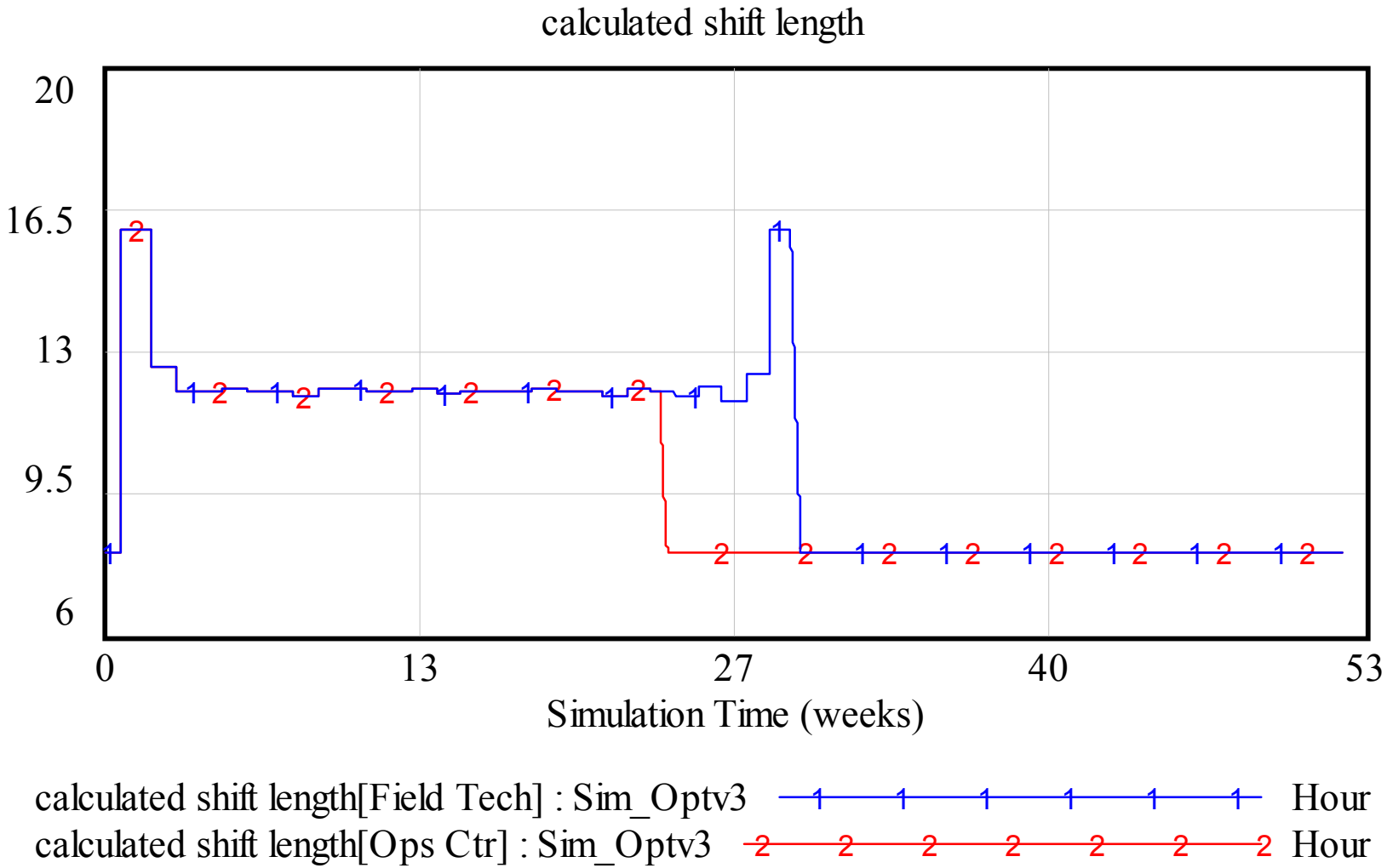
Total Worker Cost vs. Shift Length



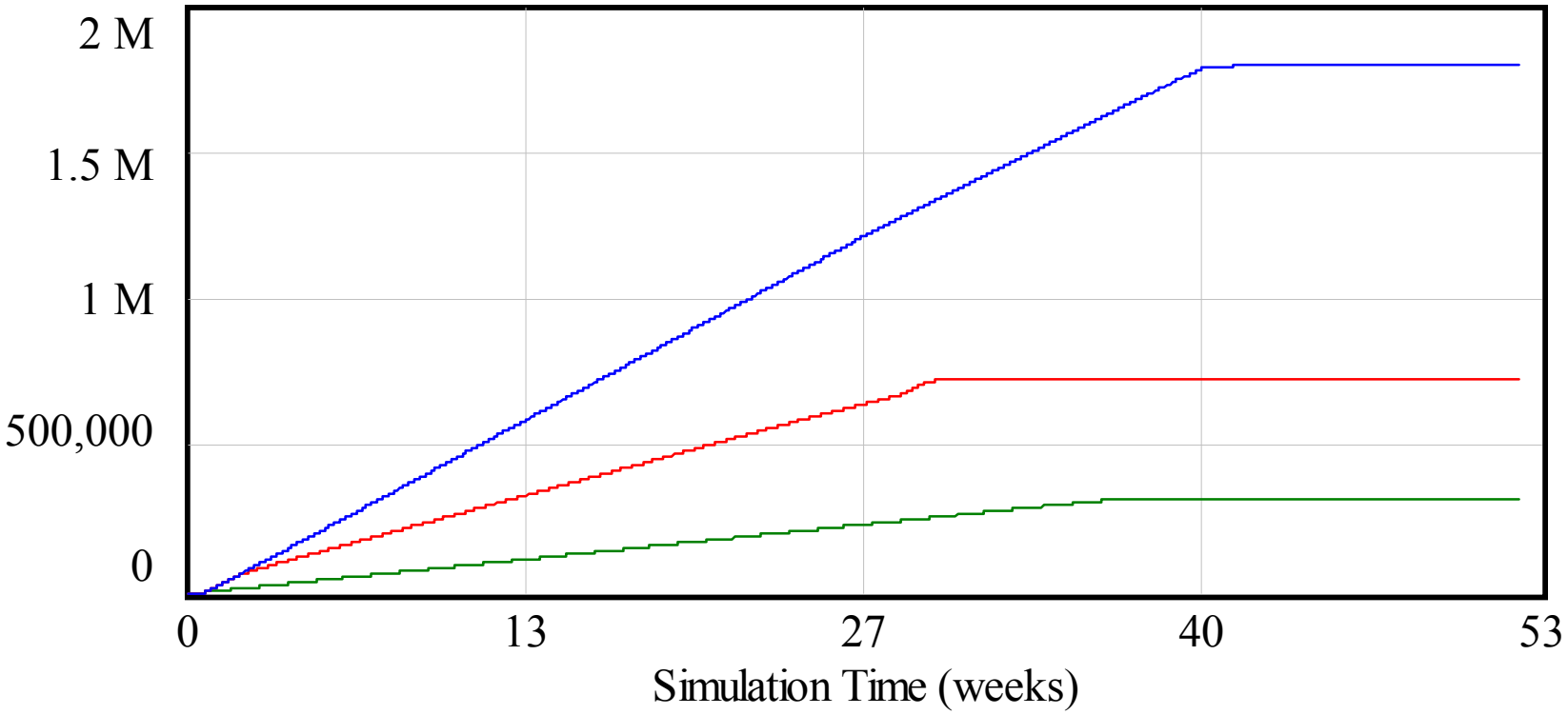
Cost Optimized Work Dispatch



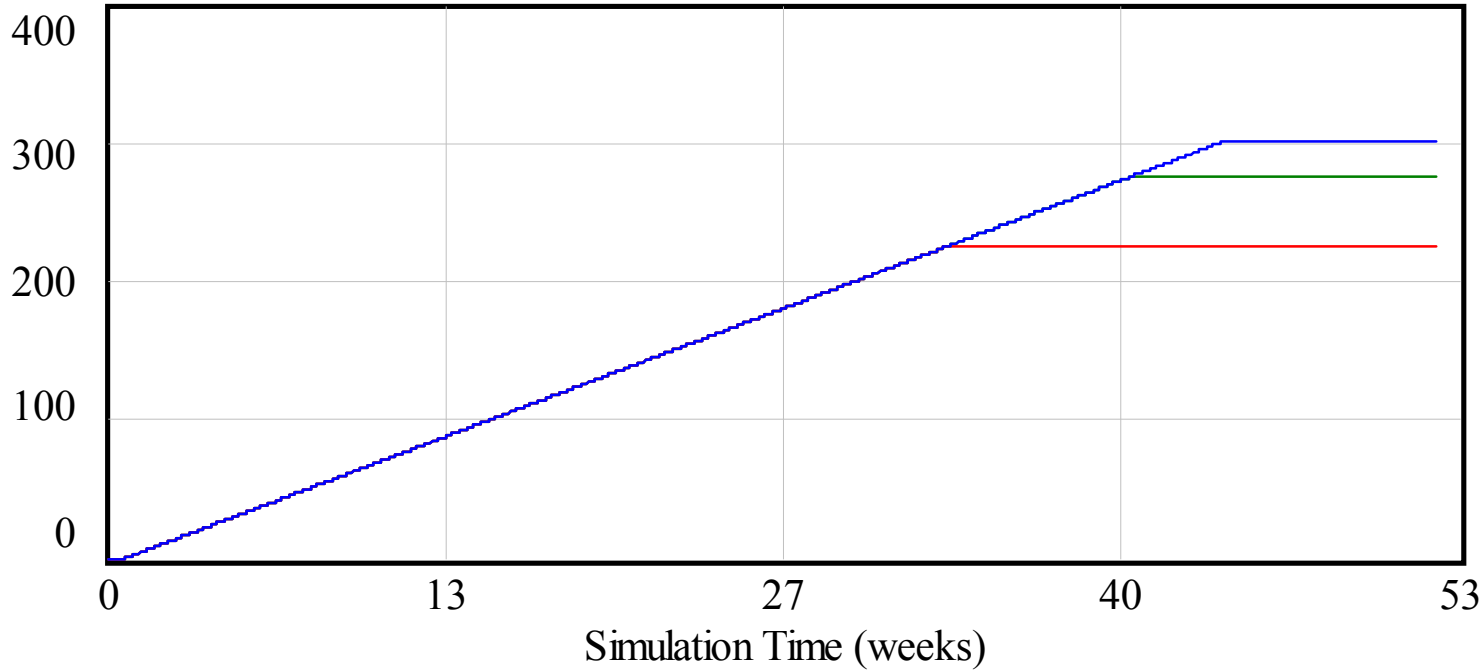
Time Optimized Worker Dispatch



Cost of Repair



Repair Time


400
300
200
100
0
0
13
27
40
53
Simulation Time (weeks)
Repair Period : Current
Day
Repair Period : Sim_Optv3
Day
Repair Period : Sim_Opt_Cost
Day

Combined (Holy Grail)

Conclusions

- Fatigue function issues
- Any optimization is better than current operations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