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Tyranny in rules, Autonomy in Maps

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Safety Management

Two themes:

- Rules pose a problem

  Can't live with them, can't live without them!

- Is there a solution?

Neil Johnston, this symposium

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…the problem of rules created by those who do not have to live the life

John Irving, discussing a dominant theme of his book, The Cider House Rules

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A Case Study: Operation Provide Comfort

Northern Iraq, 14th April 1994:

Two USAF F-15s shot down two US Army Black Hawk helicopters:

- F-15s, Sanitizing the *no-fly* zone
- Black Hawks, Maintaining independence
- AWACS, Everyone is responsible

A Failure to Integrate

- Local adaptation of work practices

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Practical Drift: Operation Provide Comfort

- Rational design produced a system that was globally coherent
- Processes to maintain integration were weak
- Given weak integration, drift at the level of local constraints was inevitable

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Practical Drift: Operation Provide Comfort

- A serious problem for loosely coupled systems with catastrophic potential
  - unusual circumstances & normal processes converge into an unusual (but not extraordinary) confluence of tightly coupled systems
- The more onerous the rules, the more powerful the force that generates local drift

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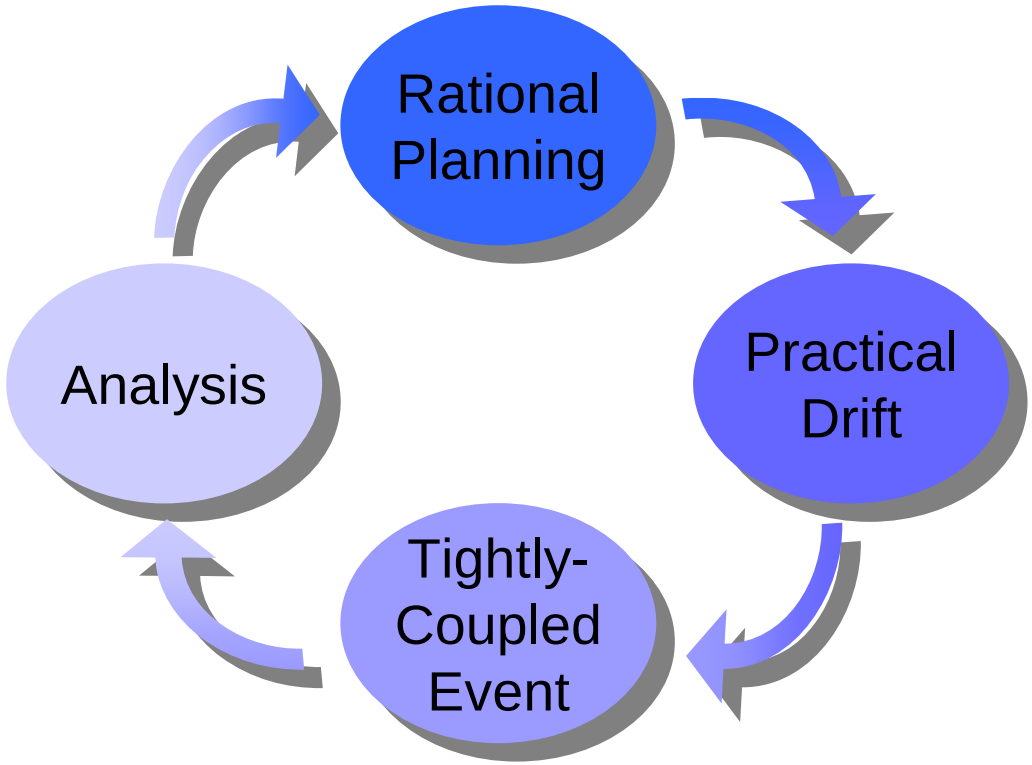
Practical Drift: The Pump



Local practice drifts away from global constraints:
A cycle of Rational Planning → Practical Drift → Tightly Coupled Event → Analysis → Rational Planning → Practical Drift → ……

“Well Homer, you’re the only one who’s read those rules and so you’re the only one feeling guilty.”

Arthur Rose, Crew Boss (played by Delroy Lindo) in the film version of The Cider House Rules

Also note that Homer was the only member of the crew who could read!!!

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Rules as Constraints: Local & Global

- Rules can create distortions
- Rules are often ignored for good reasons

Rules are a product of rational design:

- Do we need them?
- Is there any other way?

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Adaptation in Local Constraints

- Local adaptation is inevitable
- More significantly, **local adaptation is good**
- Working out procedures in practice

- Process of change, induced by operational experience, has enormous (and generally untapped) potential to enhance safety

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The Problem

Local adaptation can break the coordination between local and global constraints

Resulting in a failure of integration

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The Solution

A structured **Knowledge Map**

- Ensure coordination between local and global constraints
- Avoiding the failure of integration

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Structuring the Information Space

- A picture, supporting attentional shifts of location & depth, navigation through a complex information space,associating diverse properties as needed
- Use functional abstraction & granularity as prime organizing principles to support operational personnel as they explore the constraints of their work domain
  - ***the deep structure of the workspace***

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An Integrated Knowledge Map

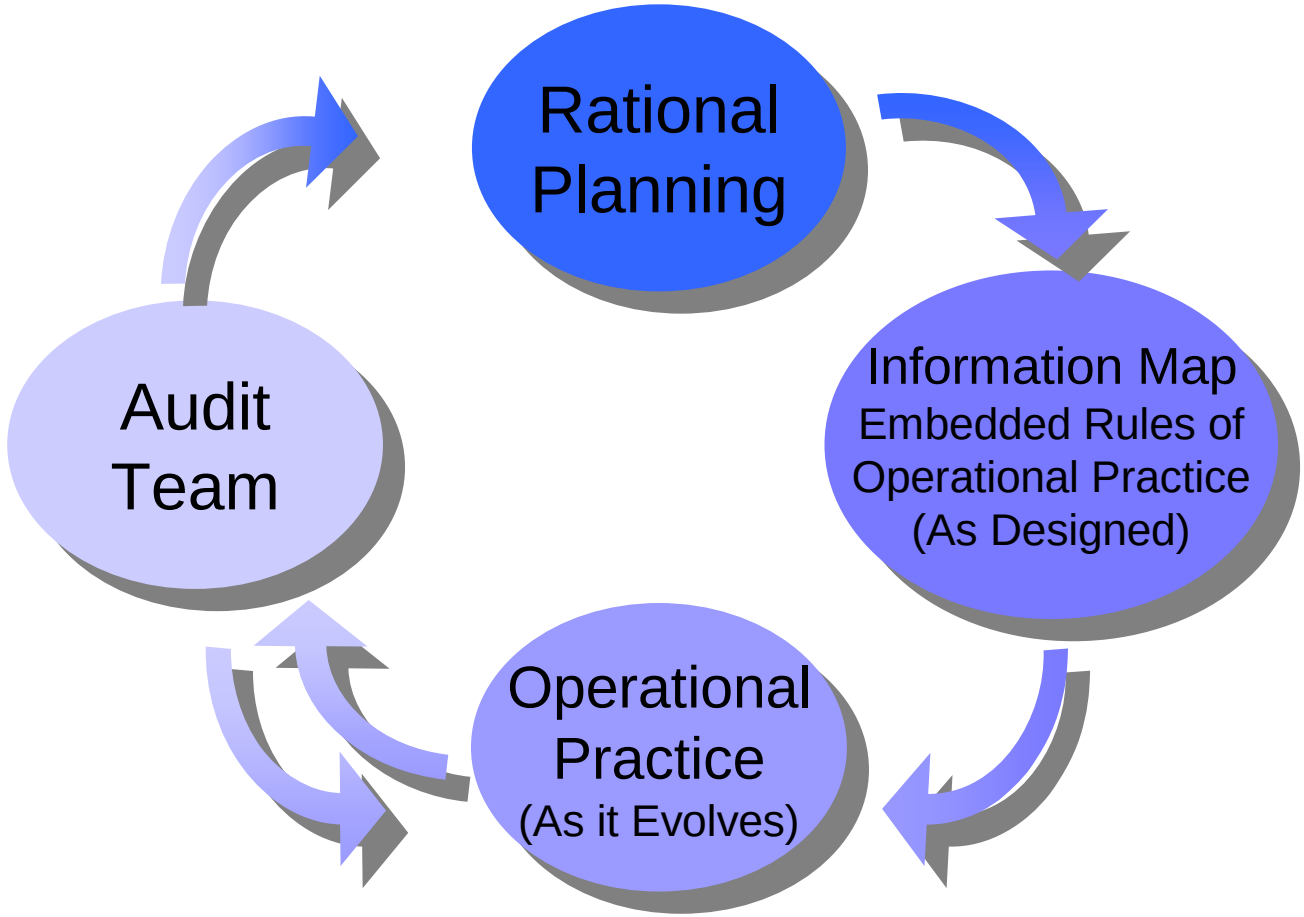
Depicting

- ***Global constraints from rational design***
- ***Design rationale***
- ***Local constraints from adaptations in practice***

For:

- ***Design & Redesign***
- ***Operational Practice***
- ***Safety Audits***

Align Design and Practice



A clockwise process flow (with the exception of the audit process) to assay operational practice & assimilate operational reports

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The Vision: What will this look like?

- An electronic surface (draftsman's table?)
- iconic representation of critical properties
- many of the standard tools of graphics programs (e.g. icon libraries, electronic pens, default shapes, connectors
- standard means of computer interaction that permit intuitive and direct selection (touch activation, drag and drop, selection, pointing and linking) to permits rapid convergence on functional clusters central to the problem at hand

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Almost all approaches to safety management are retroactive and seek to lock the system down with rules

Snook notes that we cannot solve the ensuing problems with more rules (also see Perrow), but he has no solution

My solution: ***Embed the rules into an integrated context: A Functional Map***