A case study in systems failure: NZ’s Mangatepopo Tragedy

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Presentation Outcomes:

1. Present existing analysis of event within context of system failure

2. Provide framework for understanding how individuals, systems, and organizations interact in crisis situations

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“It takes just the right combination of circumstances to produce a catastrophe.”

Perrow (1999) author of Normal Accident Theory
The Fallout

- Coroner’s inquest

- Internal Review as per OPC Trustees

- Media interest (long running)
Operator Error vs. Latent / System errors

Organizational shell

Environment

Unsafe act

Human element

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The Fallout

• Coroner’s inquest


• Internal Review as per OPC Trustees

• NZ Dept. of Labour charges

under Health and Safety Employment Act (OPC pleads guilty of 2 charges, $480,000 fines)

• NZ implements national safety regulations and auditing system

Making it an offence to provide activities involving significant hazards and some level of instruction or leadership without a current safety audit certificate, as of Oct 1, 2011

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“Human error is a consequence, not a cause.”

Reason (1997), Managing the Risks of Organizational Accidents
Systems based investigation model:

Based on Snook (2000)

Active Error: Individual sensemaking and contributing actions

Latent conditions: Role definition, authority, and group contribution

Latent conditions: Organizational factors

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Operator vs. System induced error *

• **Substitution test:**

  ‘Given how events unfolded and were perceived in real time, is it likely that a new individual, with the same training and experience, would have behaved any differently?’

  Johnston (1995)

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Systems Failure:

1. Risk tolerance
2. Systems errors
3. Operational features

Latent conditions: Organizational factors
OPC systems failure:
Program Planning System

- Risk and skill
- Solo instructing
- No map!
- Hazard identification

- Practical drift and check in procedure
OPC systems failure:
Client Information System

• Informed consent*
• Challenge by choice
• Swim confidence vs. ability

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OPC systems failure: Equipment Mgt. System

- Radio communication
OPC systems failure: Crisis Mgt. System

- Non-clicking triggers*
- Gorge rescue plan
- Rescue resources

- Learning

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Non-clicking Triggers

• Gradual change research
  http://www.youtube.com/watch?v=_1Cp3Ux85IE

• Return to slideshow
OPC systems failure: Staffing/HR System

Root causes:
1. Failure to maintain staff & supervise*
2. Learning lost / turnover
3. Production pressure
4. Competency based assessment

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OPC systems failure: Business Mgt. System

• “Culture of Production” vs. culture of safety

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OPC systems failure: Organizational Planning System

- Risk tolerance:
  - Explicit vs. implied*

- Over confidence in systems*

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“We cannot change the human condition; people will always make errors. We can change the conditions under which they work and make unsafe acts less likely.”  
Reason (1997)
Key learning:

1. Risk tolerance: explicit vs. implied
2. Train to failure – recognize non-clicking triggers
3. System function – recognize non-clicking triggers
4. Do my supervisors ‘supervise’?
5. Have we forgotten to be afraid?
References / further reading


Outdoor Pursuits Centre, NZ: www.opc.org.nz/safety


