Analysing the Institutional Responses to a Mid-Air Collision: International Regulation and the Role of ATM Research

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Key Questions

• Vast amount of research on risk analysis, SMS etc.
  – Very little research work on the impact of regulation.

• Most of Europe relies on ‘ad hoc’ regulatory intervention:
  – Few methods, less resources, politics vs engineering...

• Should macro-organisations look for consensus,
  – or should they intervene more?

• Do macro-programmes like the SSAP help to
  – prevent the possibility of recurrence of Überlingen,
  – or reduce the likelihood of recurrence?
  – or have no effect at all?
Overview

- 'Shouldn't we focus on the blunt end as well as the sharp end?

- I.e. the institutions and frameworks that act at a supra-national level.

- Unless we think that
  - (a) we can't influence them, or
  - (b) they have no real safety impact.
Extending the Swiss Cheese Model

Some holes in defences have immediate causes, e.g., failure to correctly read a warning. Others are created over a longer period of time, e.g., poor training.
Extending the Swiss Cheese Model

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The organisational response to accidents can reduce the likelihood that a hazard will recur. It may also seek to strengthen defences which failed.
Extending the Swiss Cheese Model

Some holes in defences have immediate causes, e.g., failure to correctly read a warning, others are created over a longer period of time, e.g., poor training.

Layers of Defence

Organisational Response

Adverse event

National and International Regulation...
Introduction to RPDM...

Experience the situation in a changing context

Perceived as typical (Prototype or analogue)

Recognition has four by-products:
1. Expectancies
2. Relevant Cues
3. Plausible Goals
4. Typical Actions

Implement course of action

Review
Part One: National Regulatory Issues

‘Systemic’ approaches to safety vs judicial response to accidents
Systemic Approaches to Regulation...

- Changing views of accident causation:
  - Perfective view; ‘Systemic’ approach; Resilience Engineering.

- Public and political pressure to prevent any recurrence.
  - Don’t wait for publication of the Swiss AAIB report:
  - Amendments to the Swiss Federal Civil Aviation Act.

- DETEC also launched a ‘root and branch’ review
  - Safety First (SAFIR) action plan changes SMS.

- Federal Office for Civil Aviation (FOCA):
  - Separates responsibility for safety and policy;
  - Pattern in other industries eg Cullen on Piper Alpha
Swiss ‘Systemic’ Regulatory Intervention

Uberlingen accident triggers review of Swiss Federal ATM Safety Management

Intervention guided by ‘systems’ model (prototype) of accidents.

Recognition has four by-products:
1. Expectancies: Look at regulatory structures
2. Relevant Cues: Delays in implementing recommendations?
3. Plausible Goals: Separate delivery/service provision and regulation
4. Typical Actions: FOCA separates delivery/service provision & regulation groups.

Implement course of action

NLR Review
Swiss Federal Response (Judicial...)

- Joseph Deiss, President of Swiss Federation:

- "In the name of the Federal Council, I would like to convey to you my sincerest apologies and once again express our deep regret“

- Assures Putin they would act quickly to find “where responsibility for the errors lies and that it will take what action is required”.

- These actions include criminal proceedings.

- ‘Systems approach’ vs prosecution of 4 Skyguide managers.
Swiss Judicial Response (Ironic?)

Uberlingen accident creates public and political pressure and triggers judicial response.

Recognition has four by-products:

1. Expectancies: Accidents caused by negligent homicide.
2. Relevant Cues: Failure of management to intervene following previous incidents etc.
3. Plausible Goals: Deterrent effect, answer public and political calls for judicial response.
4. Typical Actions: Prosecutions of management and other staff.

Corporate Manslaughter legislation provides additional 'prototype'.

Implement litigation

Appeals process?
• Canadian C-45 & ACT, English 2008 Act, Scots proposals.

• Host of common issues:
  – Mens rea and the controlling mind?
  – Can you sum organisational guilt?
  – Can you prosecute government agencies?

• UK Corporate Manslaughter and Homicide Act (2008).
  – Builds on ‘duty of care’, cannot prosecute govt agencies;
  – Identification principle need not be applied.
  – Prosecution based on ‘normal working practices’.
  – Management ‘more than minimal contribution to death’;
  – unbroken chain of events.
Spanair mechanics face crash quiz

The judge investigating the Madrid plane crash that killed 154 people in August is to question three mechanics on suspicion of manslaughter.

The two mechanics who checked the plane before take-off and Spanair's head of maintenance at Barajas will appear before the judge, court officials said.

The Spanish passenger jet crashed and burst into flames shortly after take-off at Madrid's Barajas airport.

An investigation said the plane's wing flaps had been set incorrectly.

Human error

Investigators say the two mechanics had deactivated a faulty temperature gauge, but failed to spot a problem with the aircraft's take-off warning system, which was operating on the same electronic relay.
Part Two: European Regulatory Issues

Consensus approaches versus intervention through legislation?
Intervention versus Consensus?

- EUROCONTROL Convention of June 1997:
  - Majority voting, consensus not regulatory intervention;
  - EUROCONTROL lacks powers of audit & enforcement.

- EC guidance on Airborne Collision Avoidance Systems:
  - Eg Technical and ops guide WP–6-1– ACAS II Program;
  - BFU these were “only descriptions or recommendations”.

- Russian Regulatory Authority used ACAS guidance:
  - structures their training at State Special Centres;
  - But no simulator scenario training as recommended.
EUROCONTROL and Regulatory Consensus

European Commission renewed pressure for single European skies.

Pattern: EUROCONTROL achieves reform through exchange of best practice.

Recognition has four by-products:

1. Expectancies: Intervention by agreement to overcome national political opposition.
2. Relevant Cues: National differences in speed of adoption and different levels of maturity show problems in interventionist approach.
3. Plausible Goals: Use agreements to improve maturity and common standards.
4. Typical Actions: Develop consensus over common approach to safety culture, SMS implementation etc.

Implement Actions

Monitoring and Review
• Regulators often chose to limit the scope of these guidelines.
  – ANSPs lack resources to implement all guidance.

• Even where guidelines followed, compliance is often delayed:
  – e.g. until ESARRs were transposed into community law.

• Mass of paperwork, regulatory confusion...
  – ESARR6 – example of confusion over implementation;
  – ESARR4 – confusion over ‘what is a change’?

• Did we miss insights from regulation in other industries?
  – Continuing issues in European healthcare, rail, maritime...
• EUROCONTROL create Action Group for ATM Safety:
  – help European states learn from Überlingen and Linate.

• Informs Strategic Safety Action Plan (SSAP) 2003-2005:
  – Safety Related Human Resources in ATM,
  – Incident Reporting & Data Sharing,
  – Airborne Collision Avoidance Systems,
  – Ground-Based Safety Nets,
  – Runway Safety,
  – Enforcement of ESARRs & Implementation Monitoring,
  – Safety Awareness,
  – Safety Research and Development.

• But 100 of 800 work elements never completed?
European Impact… SSAP, ESP and SESAR

- SSAP closed in 2006, new challenges:
  - increasing traffic, new member states in EUROCONTROL.

- European Safety Plan (ESP) more generic than the SSAP:
  - increasingly influenced by EC’s Single Skies programme.

- Single European Sky often justified in terms of rationalisation:
  - technical innovation and functional airspace blocks (FABs);
  - 10 ACCs could do work of 50 existing ACCs?

- But consensus has never really been achieved:
  - Political divides over role of military, technical conflict;
  - States only in SESAR for the money?...
European Commission Moves to Intervention

European Commission renews focus on Single European Skies.

Pattern: Intervention guided by deregulation and nationalisation.

Pattern: Establishment of European Aviation Safety Agency.

Recognition has four by-products:

1. Expectancies: Integration of safety regulation with other European political institutions enables consistent adoption of best practice through agreement AND enforcement.
2. Relevant Cues: lack of uptake or delayed uptake of improvements identified in SSAP, inconsistency between states, different levels of maturity etc.
3. Plausible Goals: Achievement of common requirements within specified time limits backed by enforcement.

Implement Actions

Monitoring and Peer Review
European Impact… HLG

• ‘(governmental approach) cannot produce a level playing field where the implementation of rules depends on the will of States and is not uniformly implemented. There is consequently a need for the Community to be the driving force in ATM’.

• Common requirements established in EC No 2096/2005:
  – Codified many of the EUROCONTROL ESARRs;
  – previously monitored “informally” by EUROCONTROL;
  – Now legal requirements under community law;
  – Time limits established for conformance.
EASA’s scope is extended to Air Traffic Management.

Pattern: Three-part system of rule making.

Pattern: Application of ‘commitology’ as a basis for agreement.

Recognition has four by-products:

1. Expectancies: Integration of consultation and enforcement will cut through barriers to Single European Skies.
2. Relevant Cues: Lack of uptake or delayed uptake of improvements identified in SSAP, inconsistency between states, different levels of maturity etc.
3. Plausible Goals: Achievement of common requirements within specified time limits backed by enforcement but informed by consultation under commitology.

Monitoring and Peer Review

Implement Actions
European Impact… EASA

• Rules imposed on member states by European Community:
  – European Commission retains responsibility for regulation;
  – Uses EASA opinions before regulatory interventions.

• EASA’s enforcement powers will far exceed EUROCONTROL:
  – EASA directly assists development of European legislation;
  – EASA monitors application of legislation by member states;

• Better suited to more interventionist approach?
  – How to encourage implementation of regulations?
  – But how will rules will be enforced?
European Impact…Future Regulation?

- UK Civil Aviation Authority approaches to EASA enforcement:
  - 1. ‘focus on safety’ by revocation of national licences;
  - 2. ‘punitive enforcement’ criminal/administrative penalties.

- Many questions remain:
  - How can national authorities oversee EASA requirements?
  - How to deal with derogations allowing delays?

- Will take years for all states to reach shared safety maturity.

- Paradox of intervention:
  - EASA will still need consensus just like EUROCONTROL.
  - More enforcement may undermine safety promotion?
Questions remain about more active European intervention.
  - Do States have public support to enforce EC legislation?
  - Implications for their military organisations.
  - Will non-EU border States join in?

What about the problems of regulators?
Summary

- Vast amount of research on risk analysis, SMS etc.
  - Very little research work on the impact of regulation.

- Most of Europe relies on ‘ad hoc’ regulatory intervention:
  - Few methods, less resources, politics and not engineering...

- At a national level:
  - Tension between judicial approaches and ‘systems’ view.

- At an international level:
  - Tension between cooperation and intervention.

- Regulators wearing the ‘Emperor’s new clothes’?
So What?

• ANSPs have adapted to regulatory intervention:
  – ‘Keep them busy in the team’;
  – ‘Don’t involve them until the last minute’;
  – ‘They ask us what to look at...’

• Competency and staffing criteria for regulators.
  – European or national regulatory college?
  – The NTSB Academy at Williamsburg is a model.

• Irony – regulation by intervention or by ‘best practice’?

• Do we support inter-modal regulators?

• Do we exchange regulators between member states?
Questions?

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But the errors remain my own...