UPRT Delivery in Phases

Musings on Prevention and Recovery

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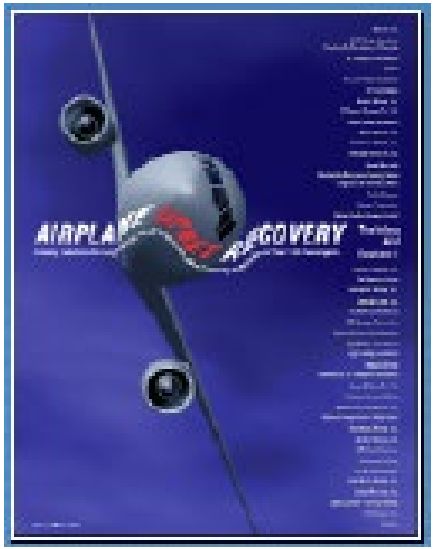
Main points

- **Can obtain infinite benefit/cost today, right now!**
  - Still, by itself, it is not enough
- **The world is divided over relative importance of prevention & recovery training**
- **Neither prevention, nor recovery, training is bulletproof**
- **In my view (money aside)**
  - Focus first on recovery training – conceptually easier and it is the last line of defense
  - Prevention training also important – conceptually more difficult and it is a bottomless pit of learning

Airplane Upset Recovery Training Aid

- **If you want infinite benefit/cost:**
  - Download the free Airplane Upset Recovery Training Aid Revision 2
    - https://www.faa.gov/other_visit/aviation_industry/airline_operators/training/media/ap_upsetrecovery_book.pdf
  - Read it repeatedly until you understand it
  - Take the Pilot-in-Training Examination in Appendix 3-A (44 questions)
  - If you miss any questions…



Prevention and Recovery Balance

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What's the right balance?

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Which is more important?

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Which should be the foundation?

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Recovery

A “modified” football analogy

You are the purple team. A goal kills you. Added rule: *only goalkeepers in goal area*!

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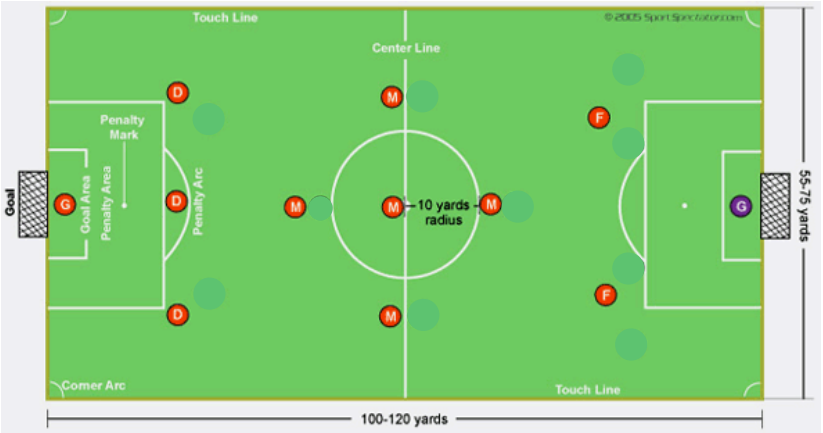

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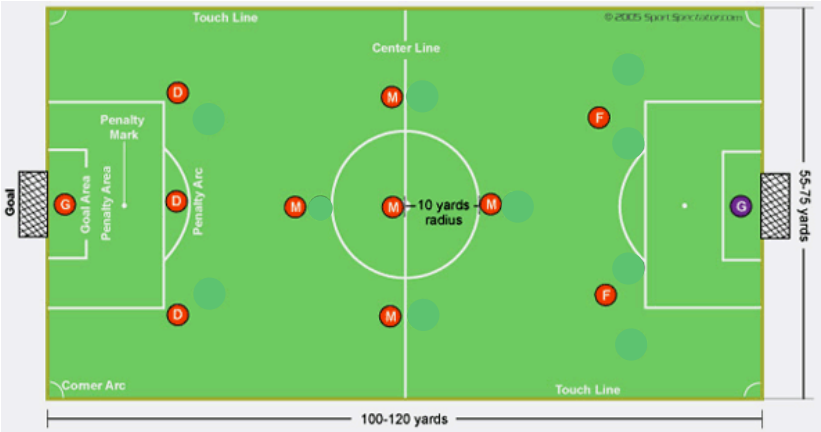

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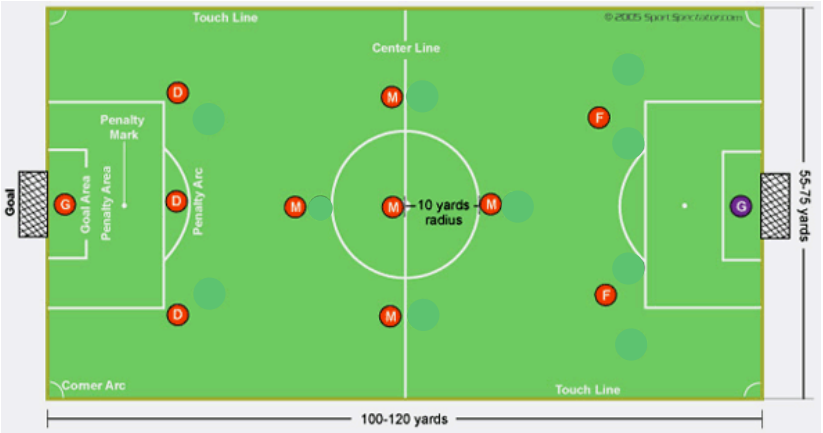

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If you could pick only one situation, which would you pick, if a goal kills you?

Accident examples

China Airlines 140

Trim & mode awareness

Airborne Exp N827AX

Operational environment

China Airlines 676

Inadequate CRM

Thai Airways 261

Mode awareness, stress

Korean Air Cargo 8509

Inadequate CRM

Gulf Air 072

Spatial awareness

Pinnacle 3701

Inadequate monitoring

West Caribbean 708

Monitoring, aerodynamics

Accident examples

Armavia 967

Airplane procedures

Adam Air 574

Distraction

Kenya Airways 507

Monitoring, spatial disorient.

Aeroflot 821

Poor CRM, spatial disorientation

XL Airways GXL888T

Trim awareness, aerodynamics

Empire Air 8284

Monitoring, distraction

Turkish Air 1951

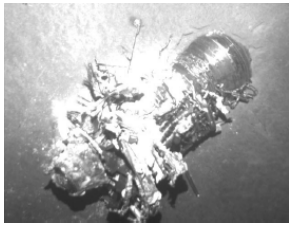
Systems, monitoring

Colgan Air 3407

Monitoring, aerodynamics, procedures

Accident examples

Air France 447



Procedures, aerodynamics

Afriqiyah Airways 771

Poor CRM, spatial dis.

Air Algerie 5017

Monitoring, aerodynamics

Air Asia 8501

Systems knowledge, aero

Lion Air 610

Systems, memory items, use of trim

Ethiopian Airlines 302

Systems

Sriwijaya 182

Monitoring? Startle?

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Who's ready to jump in a simulator and be tested on these skills?

Recovery skills to learn

- **Disengage automation**
- **Reduce angle-of-attack**
- **Get wings level**
- **Adjust thrust as appropriate**
- **Return to desired flightpath**

General technique applies to nearly all cases
A straightforward, least common denominator!
Takes training, as sometimes crews do something else

Available resources training pros/cons

- **Use what we have (i.e., don't upgrade simulator, focus on prevention)**
  - Pros: Undoubtedly, prevention helps
  - Pros: Relatively inexpensive – no device costs
  - Cons: Need to recognize prevention training alone will fail
- **Upgrade simulator, but have a slim program that focuses on recovery training**
  - Pros: Trained to recover from almost anything that happens
  - Pros: Save on labor costs with program focusing on foundations
  - Cons: Have to upgrade simulator
  - Cons: Upsets that you can recover from may still cause injuries
- **Best programs, of course, do high-quality prevention & recovery**
- **Most programs do some of both, but to be honest, I think some efforts put into today's prevention training should be applied towards near bulletproof recovery training!**

Summary

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