Practical STAMP

Checklist Design
Hazard Constraints

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Something to think about

• Safety is Action **NOT** a Possession
  – HF version

• Action = Safety ≠ Possession
  – Engineering version
The Set

- System change
- “Flap set” procedures
  - Unconstrained Hazard (flaps not set for TO)
- Checklist and associated Procedures Change
  - New constraint for the Hazard

Going to look at System Change and Hazard constraint. Hazards surrounding Flap system and Take-off flap setting procedures. How constraining one unconstrained hazard broke a hazard constraint in a different part of the system.
System Change

- Longstanding Flap Twist AD
- Re-engineering solution
- Constraining winter Flaps Fail Hazard
  - Exposes unconstrained Floating Checklist Hazard
- STAMP Systems perspective

Long Standing AD required outside visual check of Flaps setting with no twist. Use of Human procedure to constrain flap twist hazard on take-off. Manufacture re-engineering solution to constrain flap twist hazard. Allowed procedure change to constrain Flap fail hazard from freezing deice fluid in the flap mechanism. (flaps could be deiced in the retracted position which seals flap drive screws from contamination during deice process). Associated procedures exposed hazard of floating “taxi check” on the checklist.
Cues-Associated need to be unique and consistent in all world variations. Was not unique crews left to develop their own technique. Hazard of not having the flaps set for Take-off was constrained by the flaps set for walk around visual confirmation before each leg that the flaps were not twisted. Floating “taxi” check hazard was unconstrained and unknown for almost a decade. The new procedures enacted after re-engineer exposed this unconstrained hazard and led to attempted take-off without the flaps set.
Hazard discovered because of the ASAP information feed back loop in the system. If this feedback loop had not been in the system the hazard would have likely contributed to a catastrophic accident off the end of the runway. Likely blaming pilot error for not following the check list.

Linear thinking solutions(?)

• Campaign of Ops notes, Posters, training
  – Pilots viewed as: having poor checklist discipline
  – Complacent
  – Rushing
  – Exhibiting Procedural non compliance

• Ineffective Hazard constraint
  – ASAP reports continued unabated!
STAMP used by ALPA HF Safety rep to uncover the unconstrained Checklist Hazard. Systems perspective was used to point out the Hazard and why the recent procedures surrounding the larger Flap setting and checklist elements contributed to the stream of No Flap Take-off attempts. The Floating Checklist hazard is inappropriate for pilots to constrain. Using the pilots to constrain this hazard requires them to rely on know HF weaknesses of inconsistent checklist initiation cues.
Checklist and associated procedures were changed. Consistent cue for “taxi” check now is “starting engines checklist COMPLETE” aircraft is not taxied till “taxi checklist COMPLETE”

Well almost consistent--Inconsistent hazard constraint during:

Winter deice ops introduces new cue, checklist floats upon return to no deice ops

Cue broken if have to taxi to deice pad for deice. So after several deice sequences the aircraft would be started to taxi after the “starting engines checklist COMPLETE” call because that is what had been most recently done. Confirmation of this behavior was a result of the FOQA program feedback loop to the system.
Conclusion

• Flaps set before T/O
• ASAP reports ceased
• FOQA Data confirmed:
  – Checklist float during winter ops
  – Hazard still unconstrained in certain conditions