# Making ATM-Weather Integration a Reality

## A Concept of Integration (CONINT) of Weather Information and Related Systems Engineering Artifacts

*Matt Fronzak*

*FPAW Summer Meeting – NTSB Auditorium*

*August 8, 2012*

CAASD

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# In the beginning…

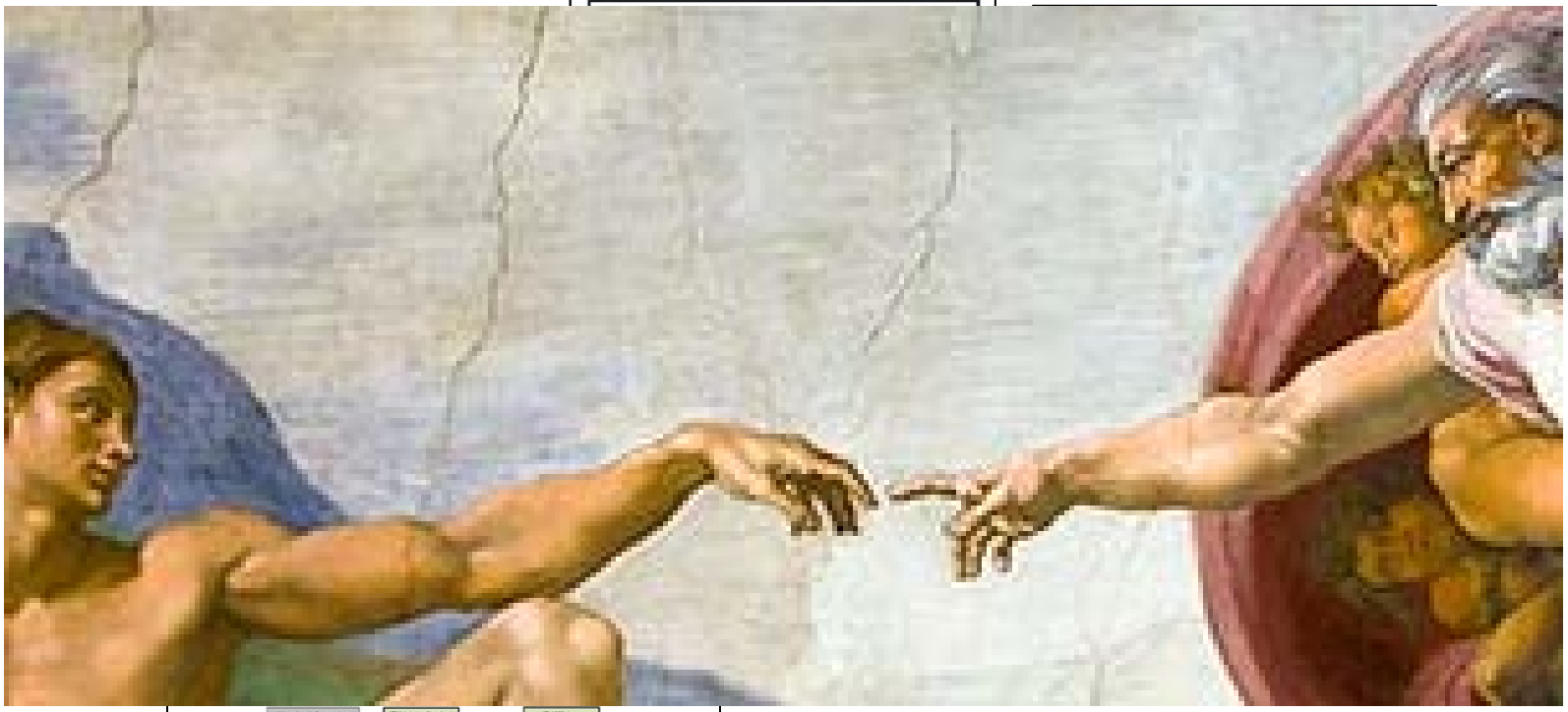
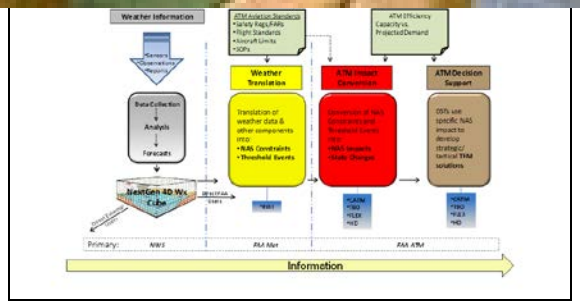


Photo credit: smithsonianmag.com

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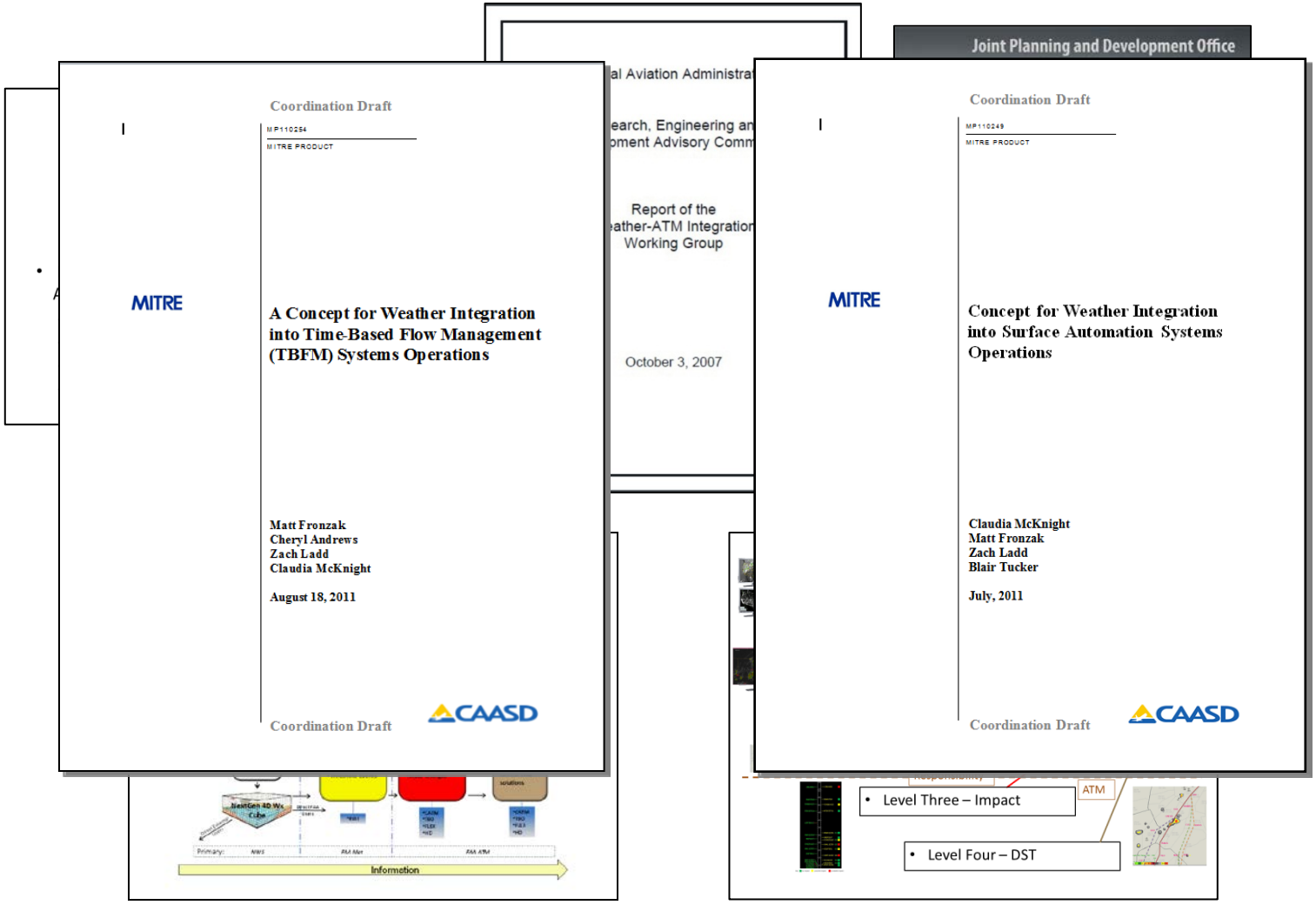
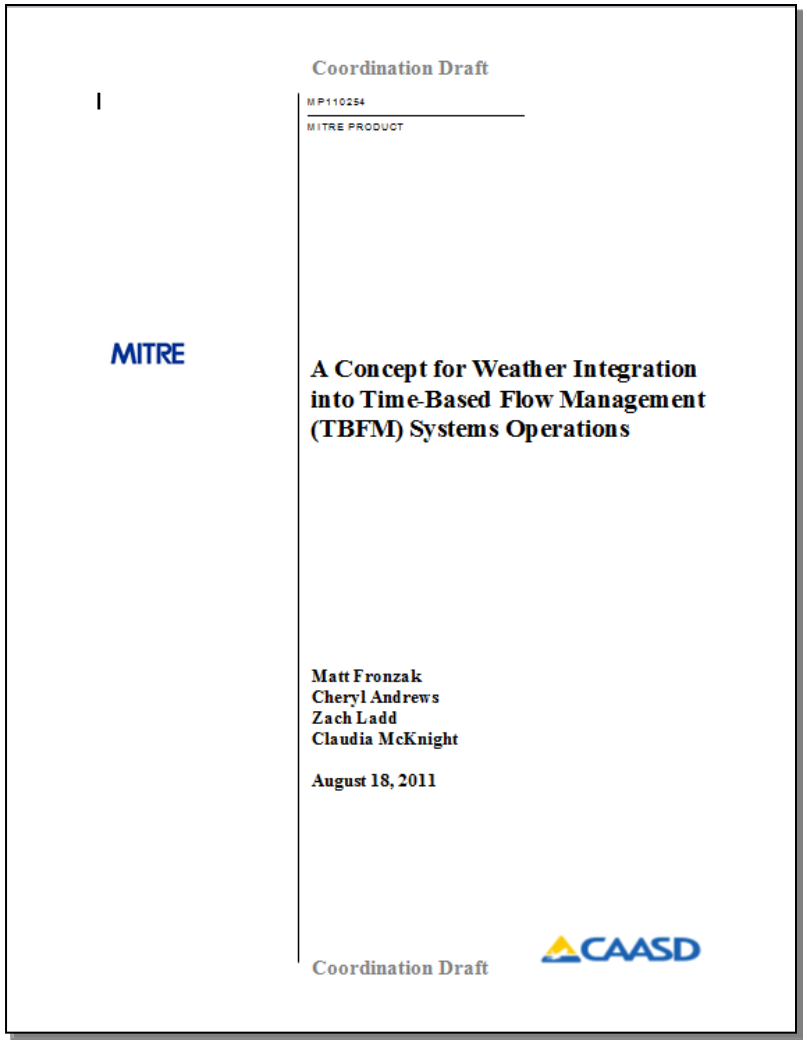


# What is a CONINT?

- Modeled after CONOPS
- Describes the target ATC/TFM system or capability
- Describes weather integration
- Postulates a concept of integrating weather into the target ATC/TFM system or capability
- Provides post-integration example(s) of the system or capability



Coordination Draft

MP110254

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A Concept for Weather Integration into Time-Based Flow Management (TBFM) Systems Operations

Matt Fronzak
Cheryl Andrews
Zach Ladd
Claudia McKnight

August 18, 2011

Coordination Draft

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# TBFM Weather Integration Phase 1 (Level 1 – Weather on the Glass)

## Description

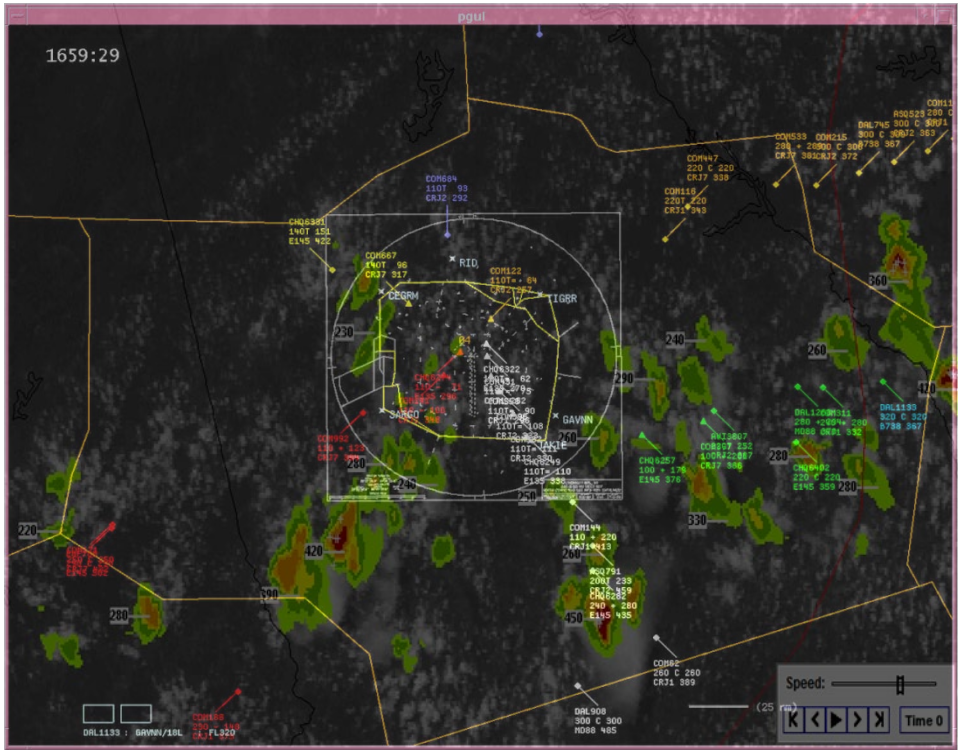
- CIWS imagery overlay on TMA PGUI

## Schedule

- Spring 2013

## Benefits

- Increased situation awareness
- Better understanding of geospatial relationship between incoming traffic and forecast thunderstorms




Notional illustration of TMA PGUI with CIWS imagery overlay

## Shortfalls

- Cognitive impact calculation, solution development

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# TBFM Weather Integration Phase 2 (Level 3 – Impact Indicators)

## Description

- **Individual flight and flow impact on TMA TGUI, flight lists and data blocks via "stoplight" indicators**

## Proposed Schedule

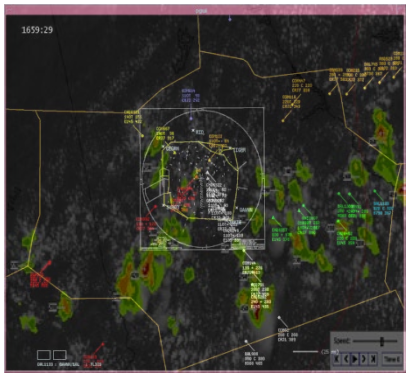
- **Mid-term (2015-2018)**

## Benefits

- **Automatic impact calculation**

## Shortfalls

- **Manual solution development**



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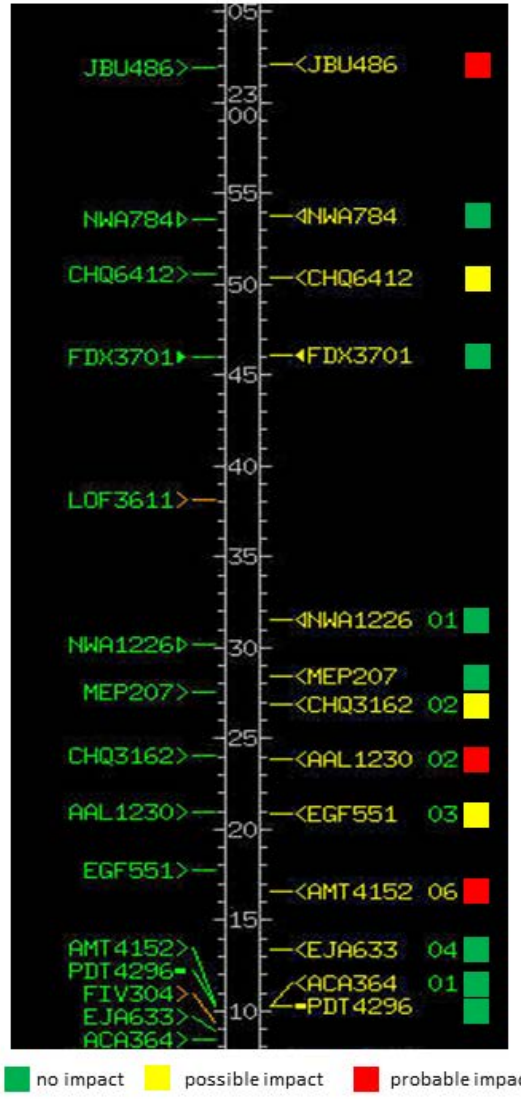


Notional illustration of TMA TGUI with "stoplight" impact indicators

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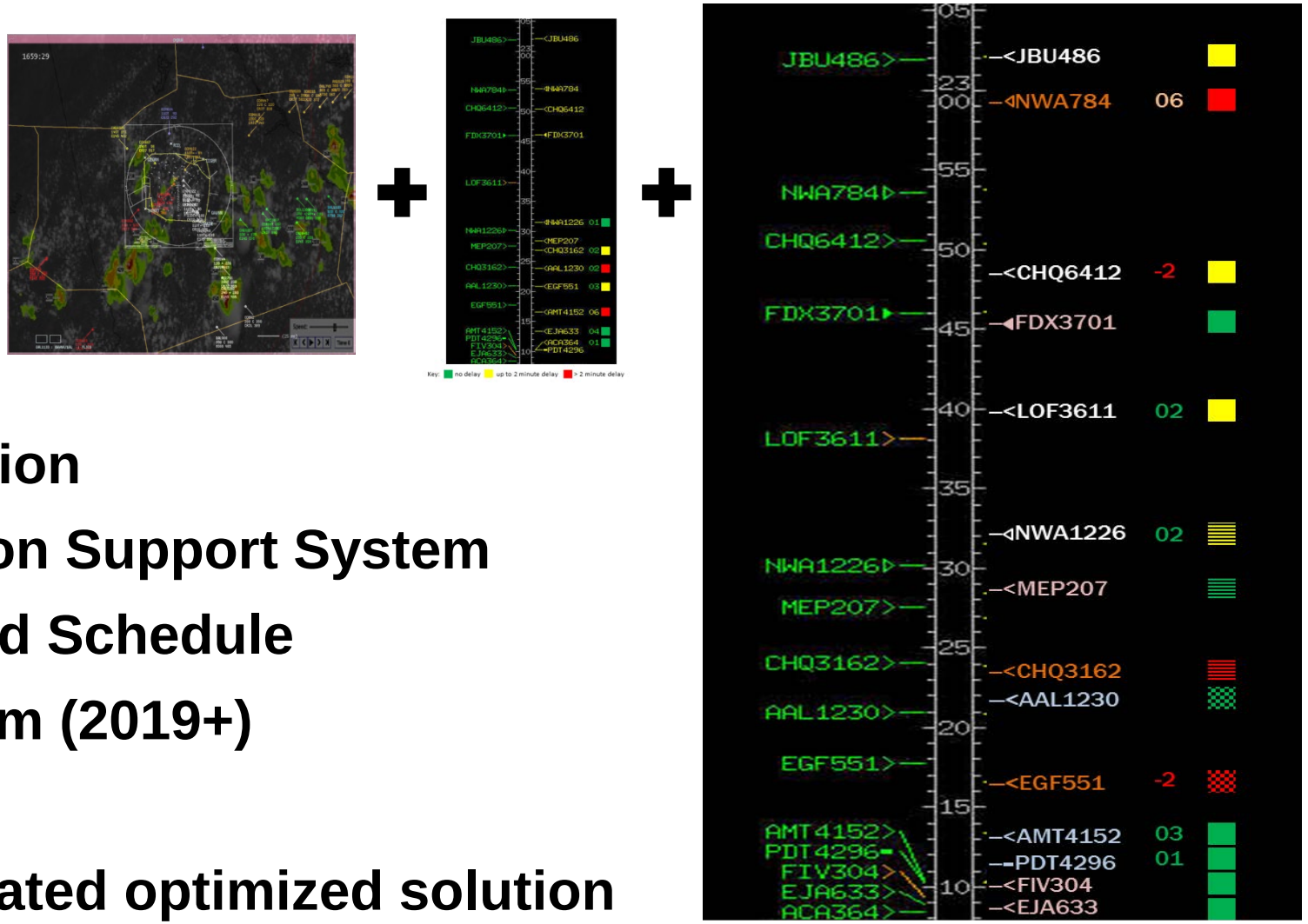
# TBFM Weather Integration Phase 3 (Level 4 – Full DST functionality) (Convection)




## Description

- Decision Support System

## Proposed Schedule

- Far-term (2019+)

## Benefits

- Automated optimized solution recommendations

Notional illustration of TMA TGUI with flight list swap recommendations

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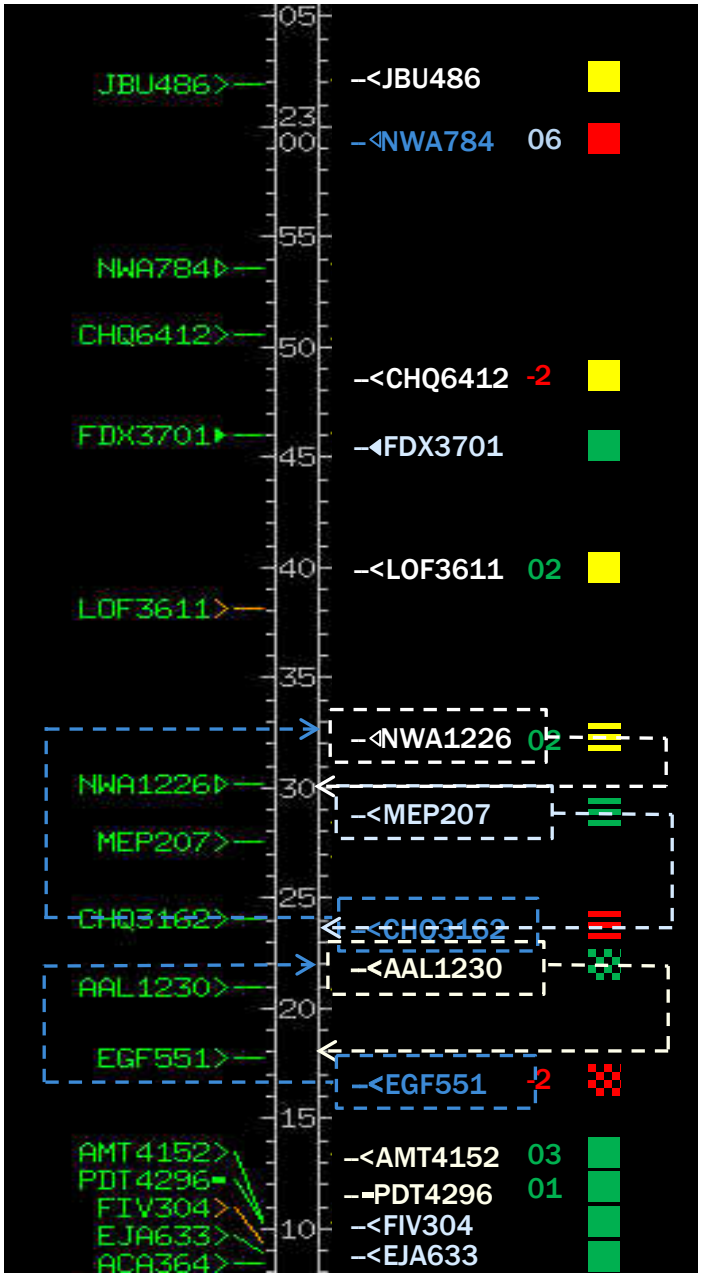
# TBFM Weather Integration Phase 3 (Convection) – Notional DST Operations

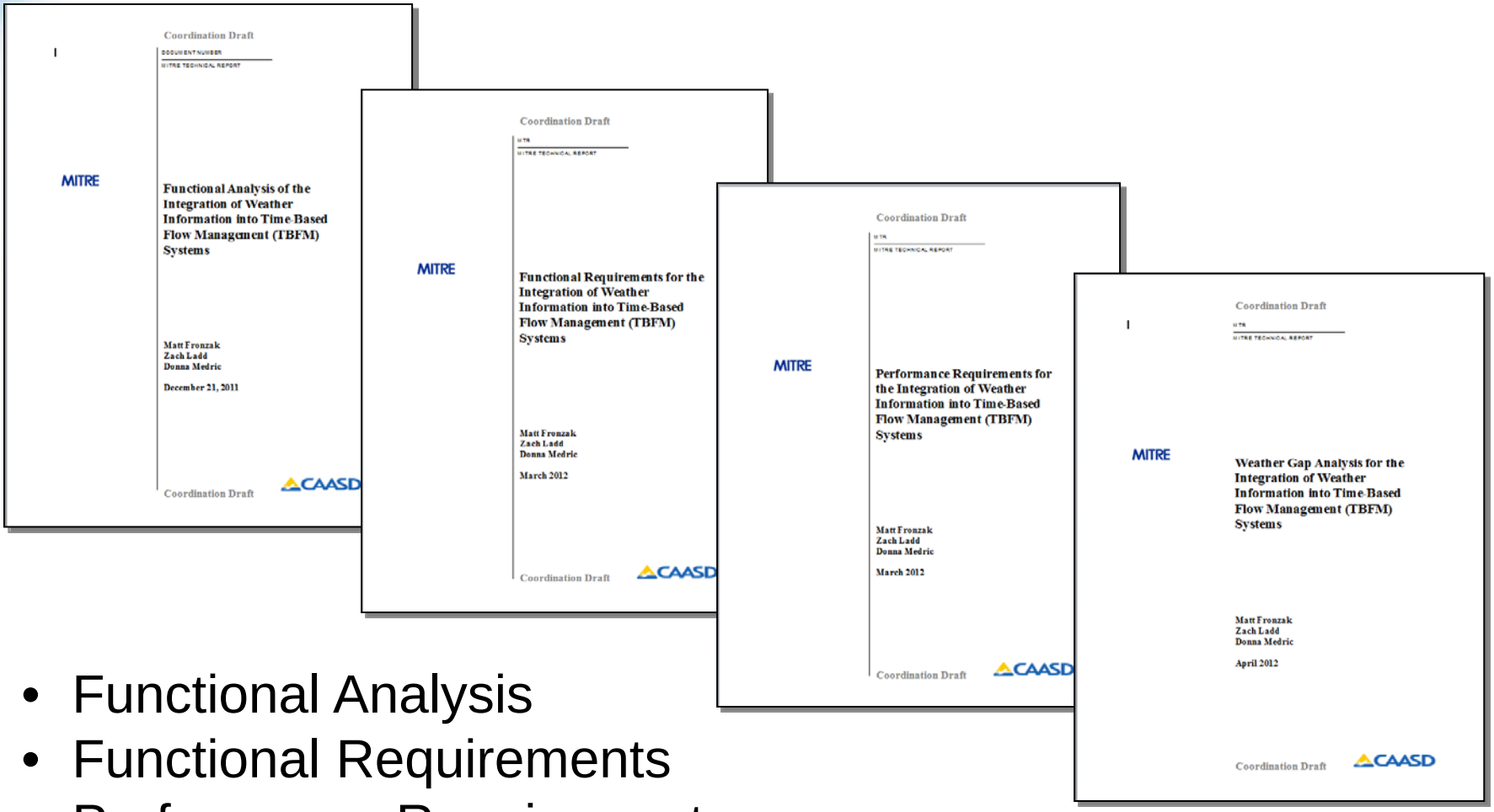
## Description

- A mouse click on one of each of the special impact symbols causes the DST recommendations to be graphically displayed
- A quick glance at the TMA PGUI with CIWS overlays suggests that both of the recommendations appear to be good solutions (HOTL)
- One more click on one of each of the special impact symbols executes the flight list changes




Notional illustration of TMA TGUI – times and positions are not to scale

# Related Systems Engineering Documents




- Functional Analysis
- Functional Requirements
- Performance Requirements
- Weather Gap Analysis

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# Next Steps and Issues

**Next Steps – FY12**

- **Transition both CONINTs from Coordination Draft to V1.0 by the end of September**

**Next Steps – FY13**

- **Transition all related systems engineering documents from Coordination Draft to V1.0**
- **Complete a similar set of documents for CATM**
- **V2.0 of the ATM-Weather Integration Concept Diagram**

**Issues**

- **Engagement strategy**
- **Weather forecast performance criteria**

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