



Halon Replacement for Airplane Portable Fire Extinguishers - Progress Report

International Aircraft Systems Fire Protection Working Group Meeting

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Objective

**Provide a progress report on the development of
BTP (2-bromo-3,3,3-trifluoropropene),
a promising new environmentally progressive
Halon 1211 replacement agent for
handheld fire extinguishers**

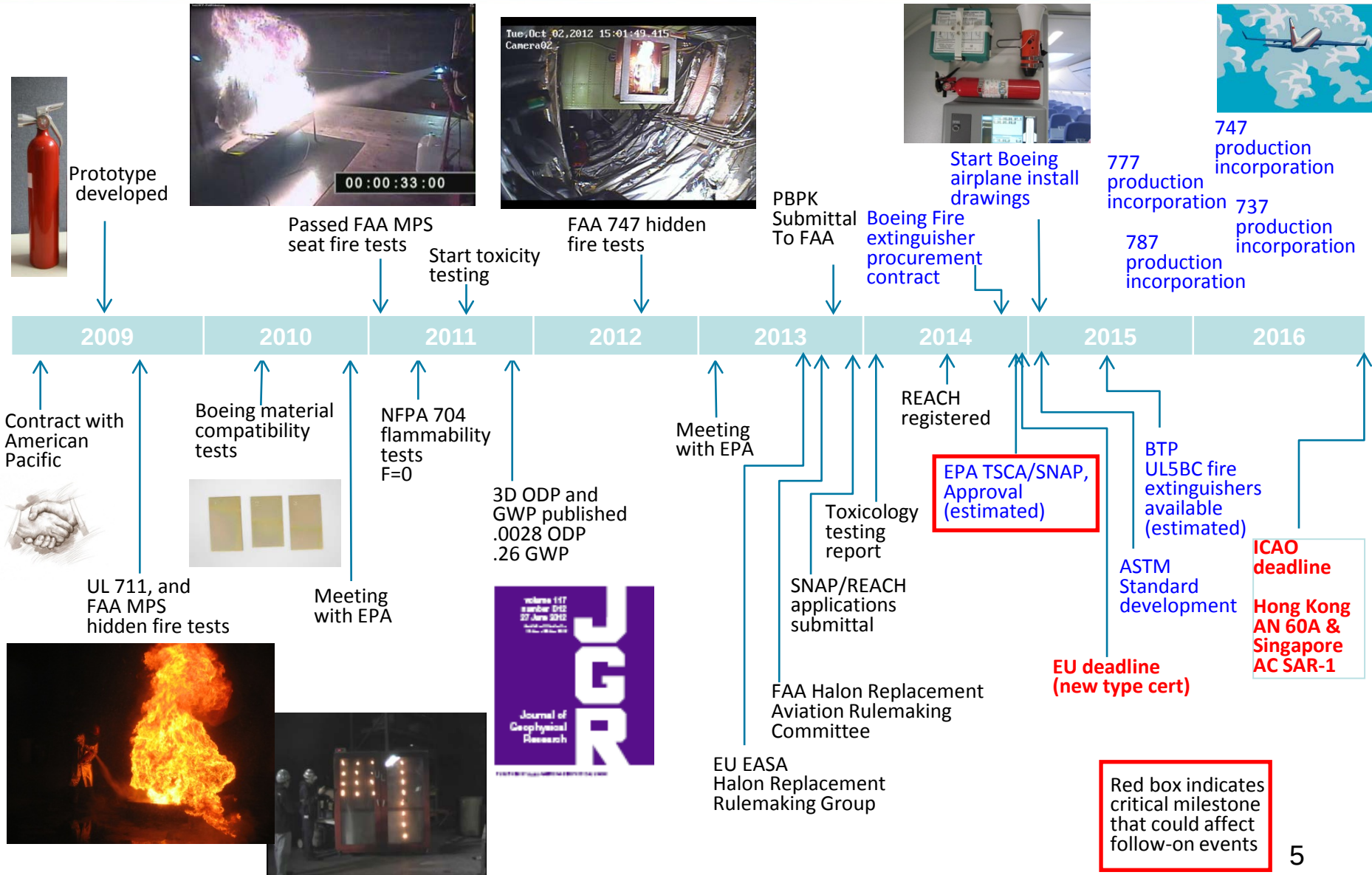
Agenda

- **Steps to Commercialization**
- **BTP Development Time Line**
- **Current Progress**
- **Future**
- **Questions**

Steps to Commercialization

- ✓ Cup burner testing - 2002
- ✓ Initial toxicity tests (Ames, cardiotox...) - 2002
- ✓ 2-Dimensional Ozone Depleting Potential (ODP), Global Warming Potential (GWP), atmospheric lifetime - 2004
- ✓ Prototype extinguisher, near drop-in replacement for Boeing 1211 extinguisher - 2009
- ✓ Underwriters' Laboratory (UL) 711 5B pan fire tests - 2009
- ✓ UL 711 cold temperature pan fire test - 2009
- ✓ Federal Aviation Administration (FAA) Minimum Performance Standard (MPS) AR-01/37 hidden fire tests - 2009
- ✓ 3-Dimensional model analysis of ODP and GWP - 2010
- ✓ FAA MPS AR-01/37 seat fire toxicity tests - 2011
- ✓ American Society for Testing and Materials (ASTM) flammability tests (per NFPA 704) - 2011
- ✓ Airplane material compatibility tests - 2011
- ✓ Synthesis of BTP for toxicology testing - 2011
- ✓ Publication of 3D ODP/GWP scientific paper - 2011
- ✓ Additional BTP physical properties testing – 2011
- ✓ Physiologically based pharmacokinetic (PBPK) testing and modeling –2013
- ✓ Toxicology testing – 2013
- ✓ Provide PBPK data to FAA for inclusion in Advisory Circular (AC) 20-42D & FAA/AR-08/3 – 2013
- ✓ US EPA Significant New Alternatives Policy (SNAP) application – 2013
- ✓ EU Registration, Evaluation, Authorization & Restriction of Chemicals (REACH) application - 2014
- ❑ US EPA Toxic Substances Control Act (TSCA) inventory listing
- ❑ EPA SNAP approval
- ✓ European Chemicals Agency (ECHA) REACH registration
- ❑ ASTM standard for BTP
- ❑ 3.25" diameter bottle for Boeing retrofit
- ❑ UL 2129 fire extinguisher bottle tests and UL listing

BTP Development Time Line



BTP Current Progress

❑ EU ECHA/REACH registration and US EPA SNAP/TSCA approval:

✓ REACH registration completed:

http://apps.echa.europa.eu/registered/data/dossiers/DISS-fb17a354-2b1c-55c5-e043-1cdf090acd41/DISS-fb17a354-2b1c-55c5-e043-1cdf090acd41_DISS-fb17a354-2b1c-55c5-e043-1cdf090acd41.html

- ➔ TSCA/SNAP application was submitted to EPA December 2013.
- ➔ TSCA review period extended multiple times at request of TSCA.
- ➔ TSCA/SNAP has not provided an estimated completion date.

REACH registered – still waiting for EPA approval

Future

- ❑ Boeing is proceeding with implementation planning of BTP fire extinguishers.
- ❑ Boeing has released request for quote for BTP drop-in fire extinguisher.
- ❑ American Pacific will be drafting the proposed ASTM standard for BTP.
- ❑ UL 2129 testing planned to be completed after EPA approval.
- ❑ Further updates will be provided at the May FAA IASFPWG meeting.

Non-ODS BTP drop-in fire extinguisher with GWP < 1

Questions?

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