



# EL IMPACTO DE LA ACTIVIDAD VOLCÁNICA EN LA AVIACIÓN

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MASAIR  
MÉXICO, D.F. SEPTIEMBRE 2014



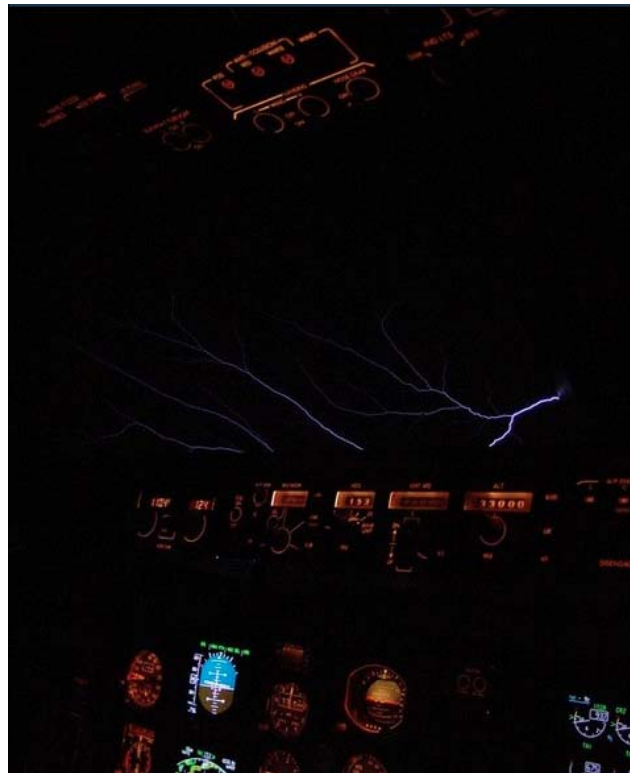
## OBJETIVO:

Reconocer las amenazas latentes generadas por la actividad volcánica durante la operación aérea para implementar estrategias que mitiguen el riesgo que genera la misma.

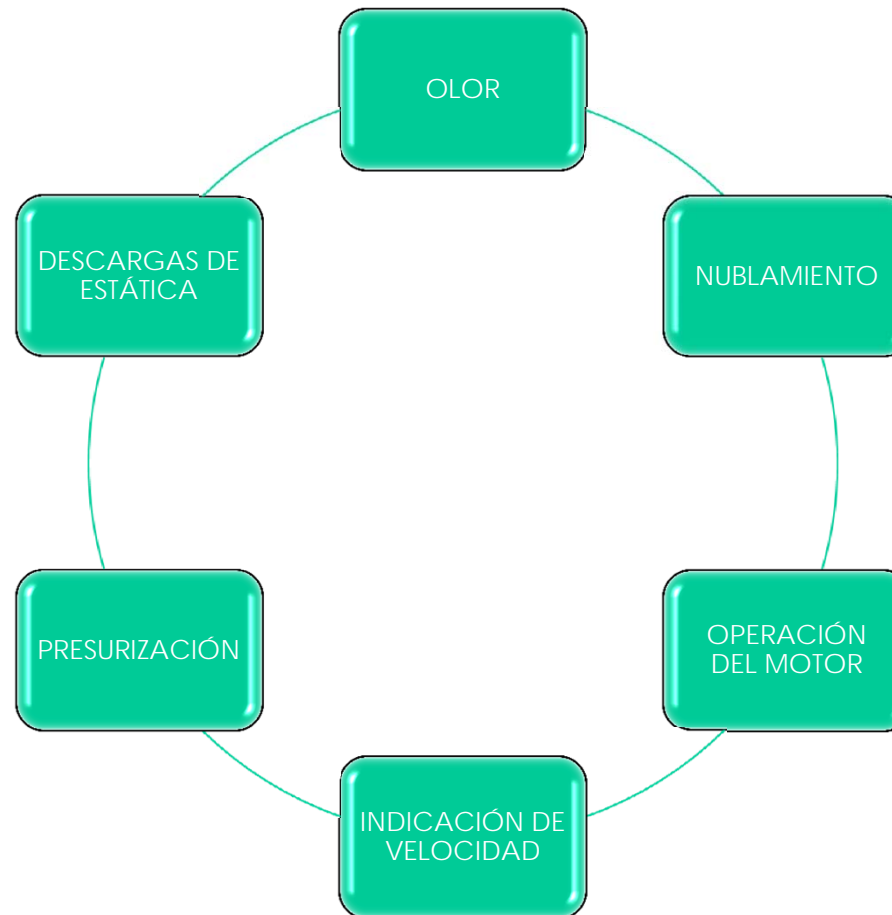


La región Pacífico y Atlántico norte, han generado en años recientes afectaciones considerables en la operación aérea con altitudes superiores a los FL300 en radios de 2400MN y hasta 72 hrs. después de la erupción.

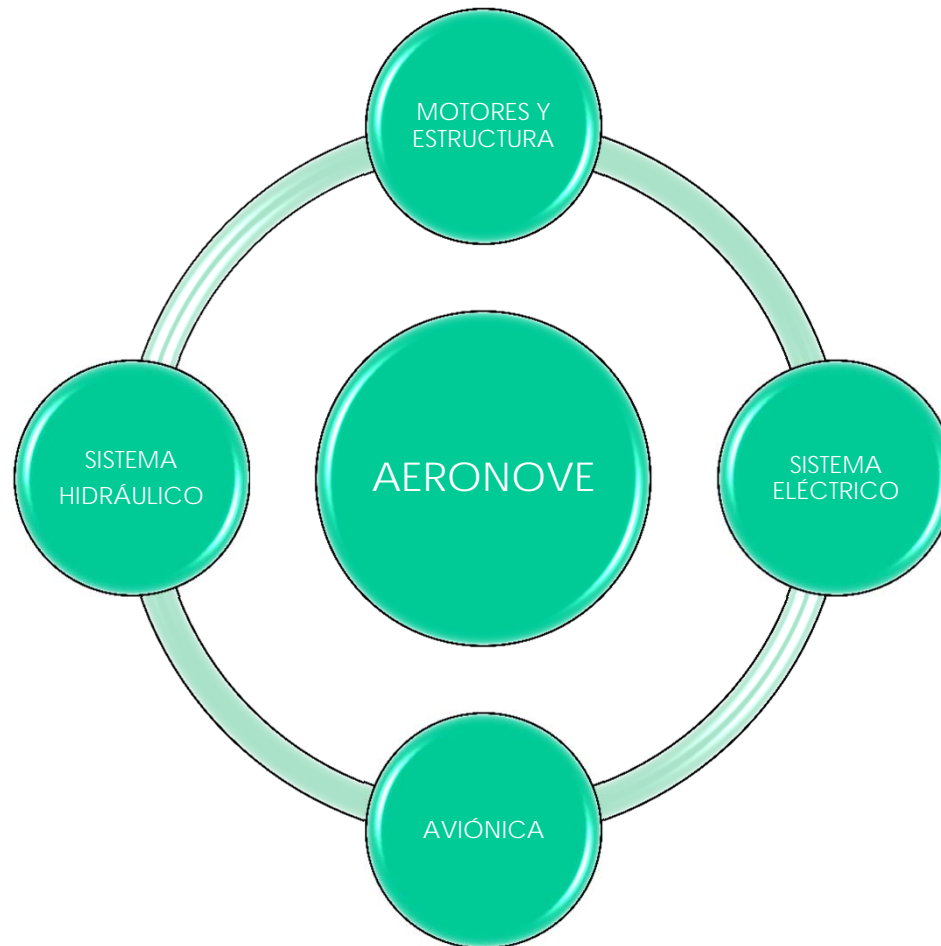
# FACTORES QUE INTERVIENEN EN EL ENCUENTRO CON NUBES DE CENIZA VOLCÁNICA



# DETECCIÓN



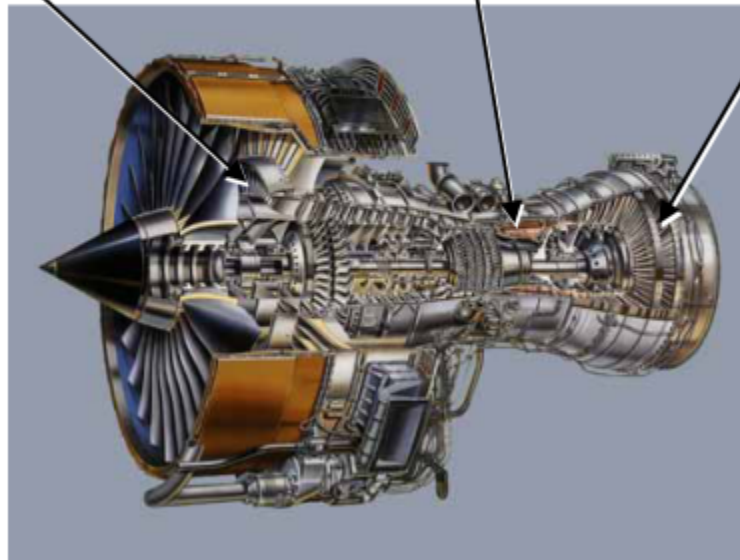
# CONSECUENCIAS



Abrasive particles can erode compressor blades edges, reducing compressor performance

Glass particles will melt in the combustion chamber, if high thrust rating is used

Melted material will cool down in the turbine and deposit on the turbine vanes





# ESTRATEGIAS DE PREVENCIÓN







# PROCEDIMIENTOS OPERACIONALES





## EN TIERRA

1. Cubiertas y protecciones al avión.
2. Limpieza del avión.
3. No utilizar limpiadores.
4. Restricción del uso del APU.
5. Operación del motor y otros sistemas.
6. Técnicas de rodaje.
7. Condición y análisis de pista



PERFORMANCE - LANDING - DISPATCH

ARPT INFO	767F-Wing-GE ARPT <b>WMMX</b>	<b>Go-Around</b> ▶ RTG	CALC
ADD ARPT	RWY <b>04R</b> ▶	<b>30</b> ▶ FLAP	SHOW ENROUTE
NOTAMS	WIND <b>0 KT</b> (0 TW/0 XW) KT	<b>0h</b> ▶ A/C	MEL
SHOW KYBD	OAT <b>18 C</b> (64 F)	<b>0h</b> ▶ A1	CDL
SHOW TAKEOFF	QNH <b>30.30 IN HG</b> (1026.1 hPa)		
EXIT	COND <b>STDNS WTR</b> ▶		
SEND OUTPUT			

767-300 / CF6-80C2B6F			
Dispatch Landing Data for Rwy 05R:			
Normal:	Limit Wt	Vref30	
	147871 KG	147 KT	
Quick Turnaround Weight:	217724 KG		
Quick Turnaround Time:	75 minutes		



## EN VUELO

1. Reducir el empuje al mínimo inmediatamente.
2. Desengarzar los aceleradores automáticos.
3. Salir de la nube de ceniza.
4. Sistemas de antihielo encendidos.
5. Encender APU.
6. Uso de oxígeno.
7. Monitoreo a motores.
8. Monitoreo de velocidad y actitud.



7.32

**BOEING**  
767 Flight Crew Operations Manual

**Volcanic Ash**

Condition: Volcanic ash is suspected when one or more of these occur:

- A static discharge around the windshield
- A bright glow in the engine inlets
- Smoke or dust on the flight deck
- An acrid odor

Objective: To exit the ash cloud and restart engines if needed.

**Caution! Exit the volcanic ash as quickly as possible. Consider a 180 degree turn. Consider a descending turn.**

- 1 Don the oxygen masks and smoke goggles (if needed).
- 2 Establish crew communications (if needed).
- 3 A/T ARM switch . . . . . OFF
- 4 **If conditions allow, run the engines at idle**  
⚠ Thrust levers (both) . . . . . Idle  
This reduces possible engine damage or flameout, or both, by decreasing EGT.
- 5 ENG START selectors (both) . . . . . FLT
- 6 ENGINE ANTI-ICE switches (both) . . . . . ON
- 7 WING ANTI-ICE switch . . . . . ON

▼ Continued on next page ▼



▼ Volcanic Ash continued ▼

8 Choose one:

◆ APU is **not available**:

▶▶ Go to step 10

◆ APU is **available**:

▶▶ Go to step 9

9 APU selector . . . . . START, then ON

10 Engines may accelerate to idle very slowly, especially at high altitude.

**Note:** Volcanic ash can cause non-normal system reactions such as:

- engine malfunctions, increasing EGT, engine stall or flameout
- decrease or loss of airspeed indications
- equipment overheat or smoke indications
- cargo fire indications

11 Slow acceleration may be incorrectly interpreted as a hung start or an engine malfunction. If N2 is steadily increasing, and EGT remains within limits, the start is progressing normally.

▼ Continued on next page ▼



7.34



767 Flight Crew Operations Manual

▼Volcanic Ash continued▼

12 Choose one:

◆Engines **flamed out or stalled, or EGT rapidly approaching or exceeding limit:**

▶▶ **Go to the Dual Engine Failure checklist on page 7.2**



◆Engines **not flamed out or stalled and EGT stabilized or decreasing:**

▶▶ **Go to step 13**

13 Plan to land at the nearest suitable airport.





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# ENVÍO DE INFORMACIÓN A TRIPULACIÓN DURANTE EL VUELO

3KACARSTS - Escritorio remoto

AIRCOM Server - AIRCOM Server V5R3 - [User Mailbox]

File Operations Window Help

Mailbox Messages Downlinks Uplinks Grounds Aircraft System Exit

Refresh Lock Sel Filter... New Reply Ack Forward... View File Delete Close

P	Ack	New	Date	Status	Message Type	Aircraft	Flight	SMI	Error	Orig. Airport	Dest. /
			Jun-13 2011 16:17:36	DN: Inbox	Off Event Report -- (raw)	N314LA	M76862	A80	0	SBEG	SKBO
			Jun-13 2011 16:01:42	DN: Inbox	Out Event Report -- (raw)	N314LA	M76862	A80	0	SBEG	SKBO
			Jun-13 2011 15:53:58	DN: Inbox	Operations Normal Report -- (raw)	N528LA	M76810	A80	0	MMGL	KLAX
			Jun-13 2011 15:53:19	DN: Inbox	In Event Report -- (raw)	N314LA	M76861	A80	0	MMMD	SBEG
			Jun-13 2011 15:53:03	DN: Inbox	On Event Report -- (raw)	N314LA	M76861	A80	0	MMMD	SBEG
			Jun-13 2011 15:53:00	DN: Inbox	Off Event Report -- (raw)	N528LA	M76810	A80	0	MMGL	KLAX
			Jun-13 2011 15:52:34	DN: Inbox	In Event Report -- (raw)	N418LA	LA1102	A80	0	KMA	KMA
			Jun-13 2011 15:52:33	DN: Inbox	Out Event Report -- (raw)	N528LA	M76810	A80	0	MMGL	KLAX
			Jun-13 2011 15:52:20	DN: Inbox	On Event Report -- (raw)	N418LA	LA1102	A80	0	KMA	KMA
			Jun-13 2011 14:42:23	DN: Inbox	Operations Normal Report -- (raw)	N420LA	UC1103	A80	0	KMA	MPTO
			Jun-13 2011 14:22:17	DN: Inbox	Off Event Report -- (raw)	N420LA	UC1103	A80	0	KMA	MPTO
			Jun-13 2011 14:12:34	DN: Inbox	In Event Report -- (raw)	N528LA	M76810	A80	0	MMMX	MMGL
			Jun-13 2011 14:01:04	DN: Inbox	On Event Report -- (raw)	N528LA	M76810	A80	0	MMMX	MMGL
			Jun-13 2011 14:00:54	DN: Inbox	Out Event Report -- (raw)	N420LA	UC1103	A80	0	KMA	MPTO
			Jun-13 2011 13:16:43	DN: Inbox	Progress Report (FMCL) -- (raw)	N528LA	M76810	FML	0	MMGL	MMGL
			Jun-13 2011 13:16:33	DN: Inbox	Off Event Report -- (raw)	N528LA	M76810	A80	0	MMMX	MMGL
			Jun-13 2011 12:54:49	DN: Inbox	Out Event Report -- (raw)	N528LA	M76810	A80	0	MMMX	MMGL

Destination: ASRVILA

Orig. Type B: [ ]

Status: DN: Inbox

Medium: MA02: MANAUS;EDUARDO GOMES AM,BRAZIL

DSP: QXB

MSN: M06A

AC Type: B787 Cargo

Raw Message: Automatic  Show free text only

To: Control Vuelo - SCL; Ricardo Pezo (local); MOC1; MOC2; Airbus (Airman); Ops Mas Air; Marito Mas Air; Ops ABSA; Marito ABSA;

From: Aircraft: N314LA Flight: M76862 Date: Jun-13 2011 16:17:36

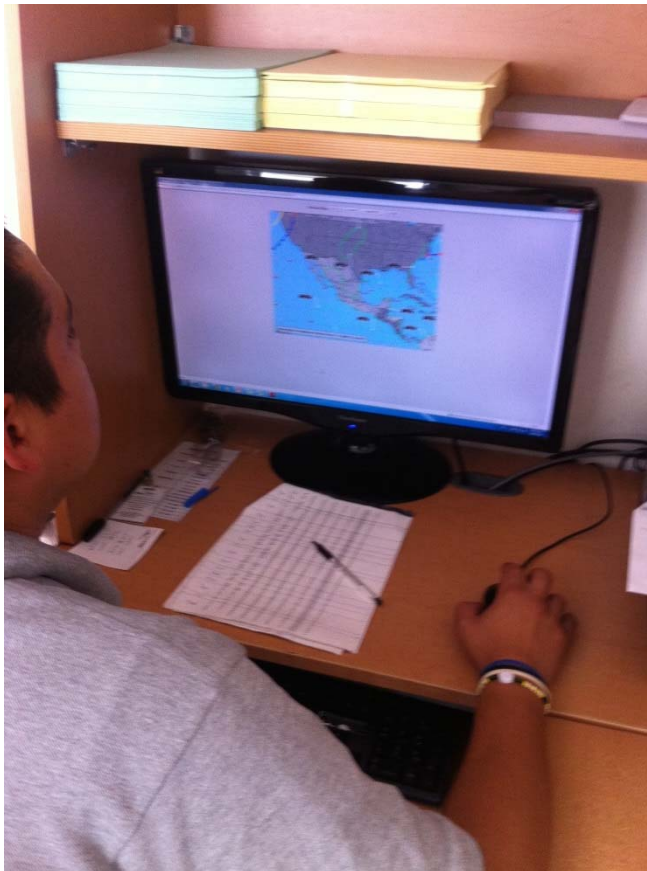
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QU ASRVILA
.QXSXMXS 131617
QAB0
FI M76862/AN N314LA
DT QXB MA02 131617 M06A
- 1101 OFFRP 6862/13 SBEG/SKBO .N314LA
/OUT 1601/OFF 1617/FOB ----/ETA 1843
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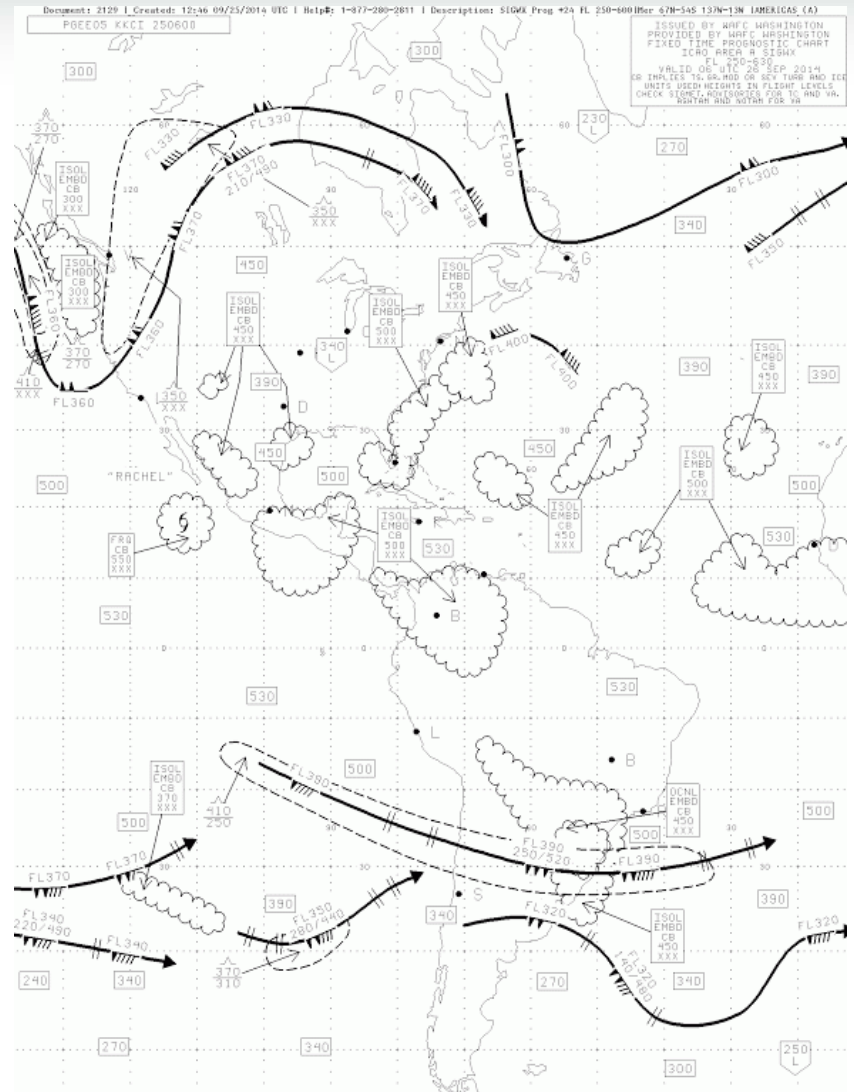
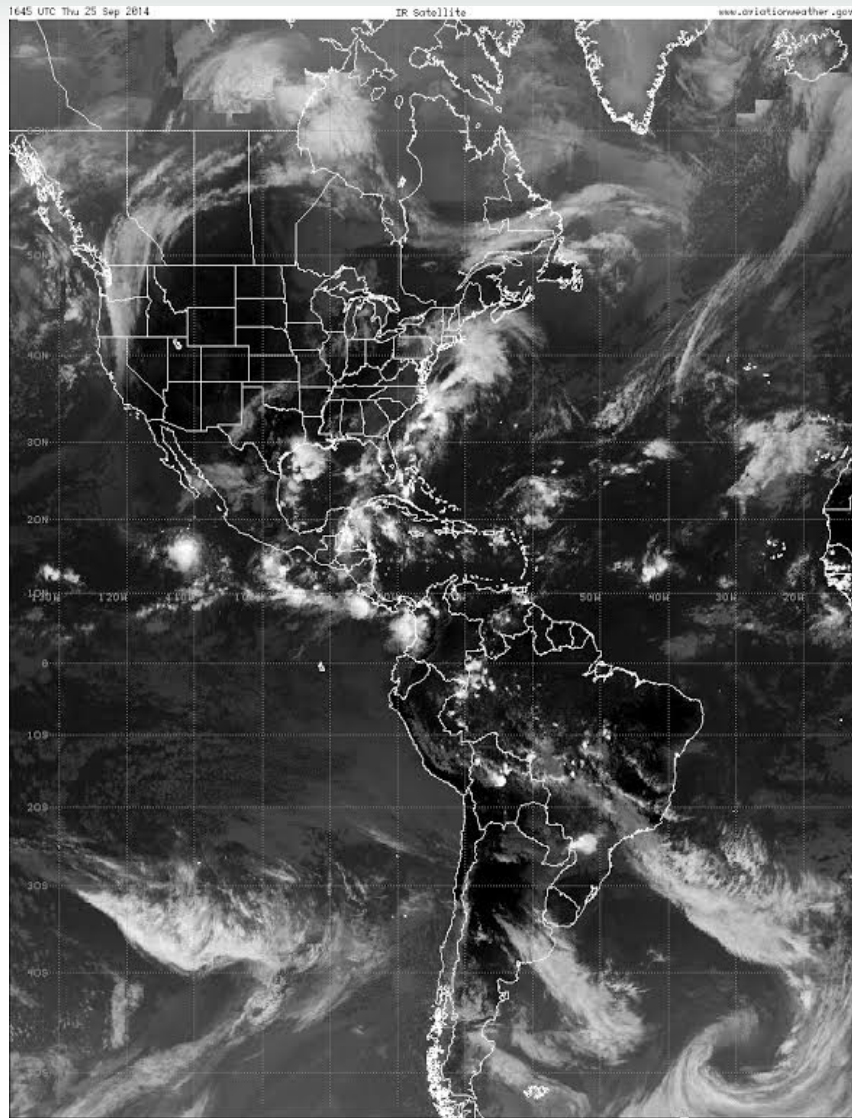
Ops Mas Air Jun-13 2011, 16:36 ONLINE Mode Messages: 92





# COMUNICACIÓN CONTINUA ENTRE DESPACHO DE VUELO Y TRIPULACIÓN







CARGO AIRLINE<sup>MR</sup>



**\*\* ASH \*\***

FVXX20 KNES 251301  
VA ADVISORY  
DTG: 20140925/1301Z

VAAC: WASHINGTON

VOLCANO: TUNGURAHUA 352080  
PSN: S0128 W07826

AREA: ECUADOR

SUMMIT ELEV: 16480 FT (5023 M)

ADVISORY NR: 2014/427

INFO SOURCE: GOES-EAST, GES WINDS, VOLCANO WEB  
CAMERA

ERUPTION DETAILS: VA EMISSIONS

OBS VA DTG: 25/1215Z

OBS VA CLD: SFC/FL180 S0126 W07844 - S0127 W07826  
- S0129 W07825 - S0132 W07845 - S0126 W07844 MOVW 15KT

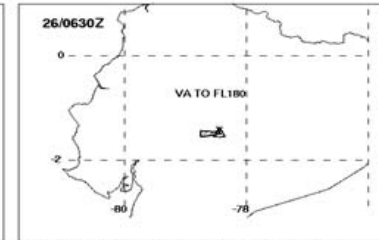
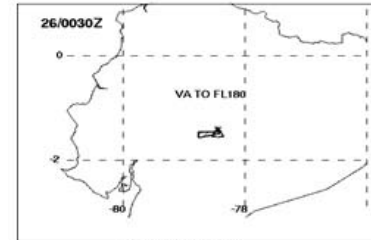
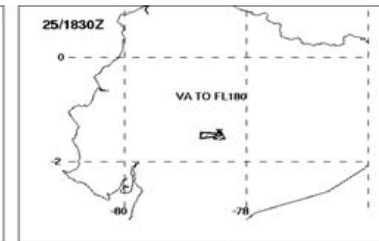
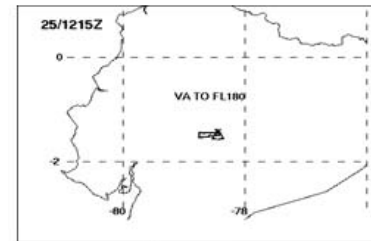
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- S0127 W07826 - S0129 W07825 - S0132 W07846 -S0126 W07845

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W07826 - S0129 W07825 - S0134 W07845 - S0128  
W07845 - S0127 W07826

FCST VA CLD +18HR: 26/0630Z SFC/FL180 S0126  
W07844 - S0128 W07826 - S0129 W07825 - S0133  
W07844 - S0126 W07844

RMK: WEB CAM SHOWING CONTINUOUS LIGHT VA  
EMISSIONS OF ABOUT SUMMIT HEIGHT. VA JUST BARELY  
SHOWING UP IN VIS IMAGERY EXTENDING APPROX 17 NM  
TO THE WEST OF THE SUMMIT. HEIGHT ASSIGNMENT  
BASED ON WINDS AND WEB CAMERA INDICATING THE VA  
PLUME IS ABOUT SUMMIT LEVEL. ...LIDDICK

NXT ADVISORY: WILL BE ISSUED BY 20140925/1900Z  
Full Size Graphic



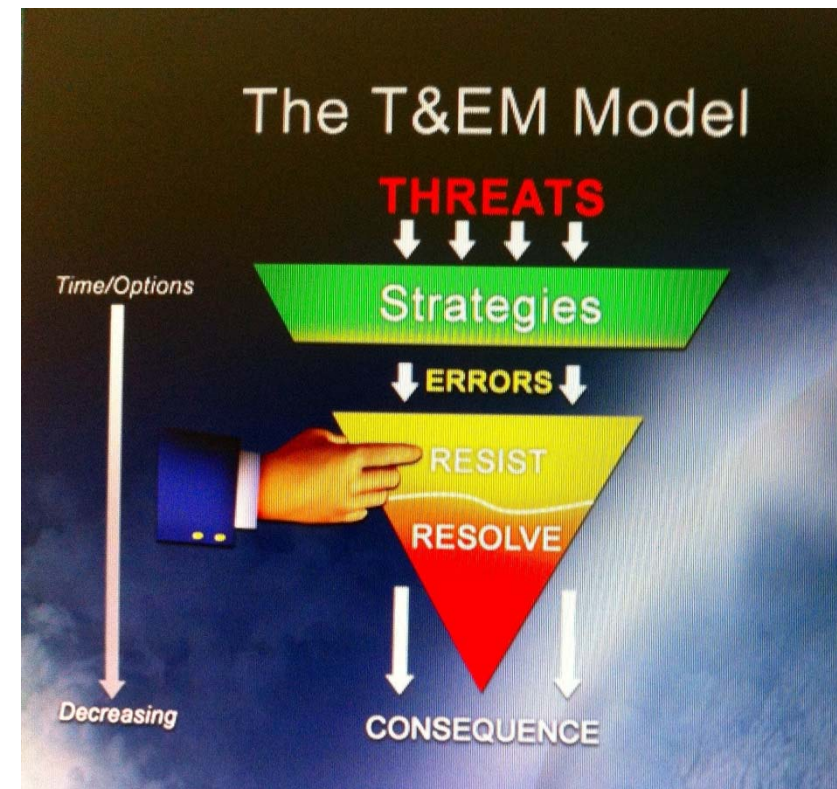
VOLCANIC ASH ADVISORY  
DTG: 20140925/1301Z  
VAAC: WASHINGTON  
VOLCANO: TUNGURAHUA 352080  
PSN: S0128 W07826  
SUMMIT ELEV: 16480 FT (5023 M)  
ADVISORY NR: 2014/427

INFO SOURCE: GOES-EAST, GES WINDS, VOLCANO WEB CAMERA.  
ERUPTION OF VAAC: VA EMISSIONS  
OBS VA CLD: SFC/FL180 S0126 W07844 - S0127 W07826  
SUMMIT HEIGHT: 16480 FT (5023 M)  
HEIGHT ASSIGNMENT: BASED ON WINDS AND WEB CAMERA INDICATING THE VA  
PLUME IS ABOUT SUMMIT LEVEL. ...LIDDICK  
NXT ADVISORY: WILL BE ISSUED BY 20140925/1900Z

CARGO AIRLINE

# CONCLUSIÓN

Establecer estrategias en conjunto para identificar las amenazas para evitar condiciones que nos lleven a tener consecuencias ante el encuentro con la ceniza volcánica.





# GRACIAS



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