Nash Derek

To: Rayner Brian
Subject: ERA14FA045

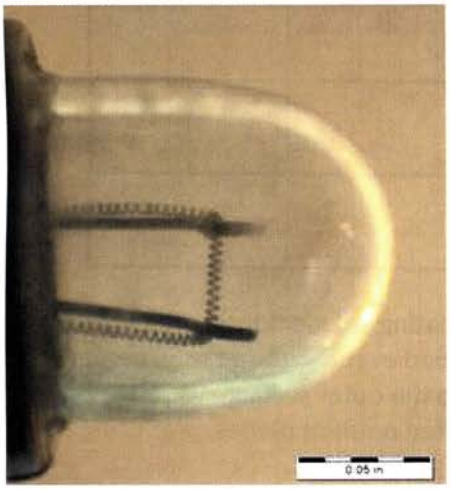
The following items were submitted for examination.

1. Thrust reverser control and segment panel.
2. Thrust reverser outer lever arm.
3. Pneumatic latches (one fractured and one exemplar).

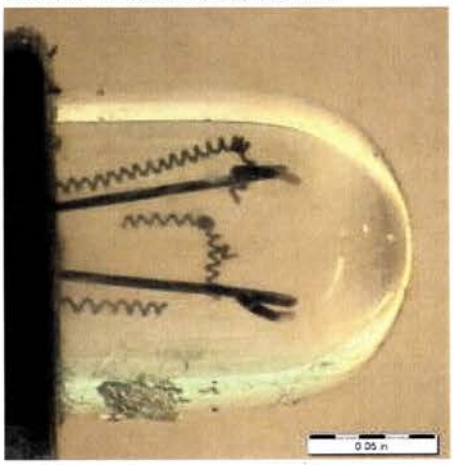
Examination of the control panel revealed that the central rocker switch was depressed on the left. As the identifications on the panel had been erased by the impact, inquiries with the manufacturer revealed that the left position was for "NORMAL" operation and the right position was for "EMERGENCY STOW".
On each side of the rocker switch, left side for the #1 engine and right side for the #2 engine, were three warning lights identified, left to right, as "UNLOCK", "DEPLOY", and "BLEED VALVE".
Each warning light contained a single bulb which was extracted for a filament examination (clear plastic covers were removed from the "DEPLOY" and "BLEED VALVE" bulbs and yellow covers were removed from the "UNLOCK" bulbs.
Examination of the filaments revealed three distinct conditions identified as:

1. Coiled and intact.
2. Coiled and broken, consistent with an impact event while the filament was cold (bulb not illuminated).
3. Stretched, consistent with the filament being at an elevated temperature during the impact event.

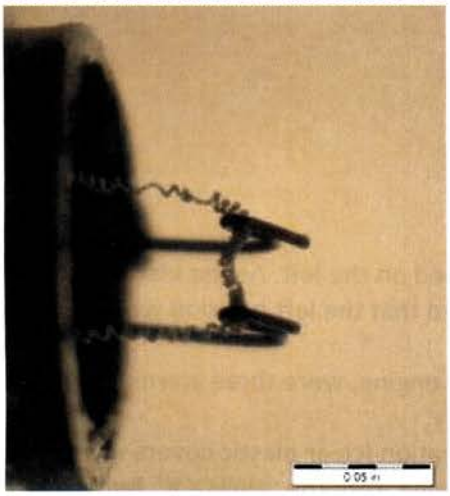
The bulbs identified as "#1 DEPLOY" and #2 DEPLOY" displayed intact coils and "#1 DEPLOY" is illustrated below.



The bulbs identifies as "#1 BLEED VALVE", #2 BLEED VALVE" and "#2 UNLOCK displayed broken coils and #2 BLEED VALVE" is illustrated below.



The filament in the bulb identified as #1 UNLOCK was difficult to see clearly so the glass envelope was removed to reveal the stretched filament illustrated below.



The condition of the filaments is also presented in the following table.

FILAMENT CONDITIONS	LEFT ENGINE (#1) WARNING BULBS			RIGHT ENGINE (#2) WARNING BULBS		
	UNLOCK	DEPLOY	BLEED VALVE	UNLOCK	DEPLOY	BLEED VALVE
COILED INTACT		*			*	
COILED BROKEN			*	*		*
STRETCHED	*					

Examination of the thrust reverser outer lever arm revealed two fracture faces originating adjacent inside radiused corners of the square end with parallel lines on the surface, consistent with an overload event. A third inside corner displayed a crack that had originated in the radius and propagated almost through to the outer surface.
Examination of the two fractures on the broken latch revealed grainy surfaces oriented on slant planes, producing a convex "v" and a concave "v", consistent with an overload event.