

Appendix A Insulation PFORs

Final Postflight Hardware Evaluation Report 360T025 (RSRM-25, STS-46)

March 1993

Prepared for:

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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Thiokol CORPORATION
SPACE OPERATIONS

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(NASA-CR-192563) POSTFLIGHT
HARDWARE EVALUATION 360T025
(RSRM-25, STS-46). APPENDIX A:
INSULATION PFORs Final Report
(Thiokol Corp.) 15 p

N93-30618

Unclas

G3/16 0171963

INSULATION REQUIRED PFOR LIST

<u>PFOR #</u>	<u>Title</u>	<u>Side</u>	<u>Joint or Location</u>	<u>Final Report Page Number</u>
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A-8	Igniter Nozzle Insert Throat Diameter Measurements	Left	Igniter Nozzle Insert	A-2
A-1	Postfire Insulation CPI Log Numbers	Right	N/A	A-3
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A-3	Forward Segment Liner Pattern	Right	Forward Segment	A-9
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(Note: Clarification forms will be inserted after the required PFOR in the Final Report. The clarification form page number will be the same as the required PFOR Final Report page number appended by a sequential alphabetic extension.)

POSTFLIGHT OBSERVATION RECORD (PFOR) A-1
Postfire Insulation Common Planning Index (CPI) Log Numbers

Motor No.: 360T025	Side: Left (A)	Date: 22 FEB 93		
Assessment Engineer(s)/Inspector(s): Bill Lesko				
<u>Record CPI Log and Postfire Part and Serial Numbers Below:</u>				
	P/N	PPC No.	Serial No.	CPI Log No.
A. Igniter Chamber	<u>1075161-01</u>	<u>918</u>	<u>3</u>	<u>4CFSN</u>
B. Igniter Adapter	<u>1077457-01</u>	<u>903</u>	<u>3</u>	<u>4CIBH</u>
Notes / Comments				

Clarification Form(s)? ☐ Yes ☐ No Clarification Form Page No.(s): _____

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-8
Igniter Nozzle Insert Throat Diameter Measurements (Data Collection Only)

Motor No.: <u>RSBM 25A</u>	Side: ☒ Left (A) ☐ Right (B)	Date: <u>10-5-92</u>
Assessment Engineer(s)/Inspector(s): <u>JED BENSON</u>		
Record the Igniter Nozzle Insert Throat Diameter Measurements Below:		
Degree Location	Diameter Measurement (Inches)	
0	<u>6.362"</u>	
60	<u>6.432"</u>	
120	<u>6.436"</u>	
Notes / Comments		

Clarification Form(s)? Yes ☒ No ☐ Clarification Form Page No.(s):

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-1
Postfire Insulation Common Planning Index (CPI) Log Numbers

Motor No.: 360T025	Side: Right (B)	Date: 22 FEB 93		
Assessment Engineer(s)/Inspector(s): BILL LESKO				
<u>Record CPI Log and Postfire Part and Serial Numbers Below:</u>				
	P/N	PPC No.	Serial No.	CPI Log No.
A. Igniter Chamber	<u>1073161-01</u>	<u>(918)</u>	<u>4</u>	<u>4CFSN</u>
B. Igniter Adapter	<u>1077457-01</u>	<u>903</u>	<u>4</u>	<u>4CIBH</u>
C. Forward Segment	<u>1076790-05</u>	<u>904</u>	<u>9</u>	<u>4CFIF</u>
D. Forward Center Segment	<u>1076791-01</u>	<u>903</u>	<u>21</u>	<u>4CFWM</u>
E. Aft Center Segment	<u>1076791-01</u>	<u>903</u>	<u>20</u>	<u>4CGXG</u>
F. Aft Segment	<u>1076957-03</u>	<u>904</u>	<u>10</u>	<u>4CGXH</u>

Notes / Comments

Clarification Form(s)? ☐ Yes ☒ No Clarification Form Page No.(s): _____

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-8
Igniter Nozzle Insert Throat Diameter Measurements (Data Collection Only)

Motor No.: <u>RSRM 25 B</u>	Side: ☐ Left (A) ☒ Right (B)	Date: <u>10-5-92</u>
Assessment Engineer(s)/Inspector(s): <u>JED BENSON</u>		
Record the Igniter Nozzle Insert Throat Diameter Measurements Below:		
Degree Location	Diameter Measurement (Inches)	
0	<u>6.356"</u>	
60	<u>6.359"</u>	
120	<u>6.399"</u>	
Notes / Comments		

Clarification Form(s)? Yes X No Clarification Form Page No.(s):

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-2
Segment Internal Insulation Condition (After Low Pressure Rinse)

Motor No.: 360T025	Side: Right (B)	Date: 10/21/92	
Assessment Engineer(s)/Inspector(s): <i>Ken Mackley</i>			
Segment: Forward			
Segment Internal Insulation Observations:	Yes	No	Comment #
A. Abnormal Erosion?	_____	☒	_____
B. Gas Paths?	_____	☒	_____
C. Ply Separations?	_____	☒	_____
D. Abnormal Blisters?	_____	☒	_____
E. Abnormal Cuts or Gouges?	_____	☒	_____
F. Foreign Material Within Insulation?	_____	☒	_____
G. Non-Uniformities in the Eleven Point Burn-out Pattern? (Forward Segment Only)	_____	☒	_____

Notes / Comments

Special Issues 3.1.1.2

nothing found - no foreign materials.

Preliminary PFAR(s)? _____ Yes ☒ No _____ Preliminary PFAR Number(s): _____

Clarification Form(s)? _____ Yes ☒ No _____ Clarification Form Page No. (s): _____

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-2
Segment Internal Insulation Condition (After Low Pressure Rinse)

Motor No.: 360T025	Side: Right (B)	Date: 2/4/93
Assessment Engineer(s)/Inspector(s): <u>Reo Mackley</u>		
Segment: Forward Center		
Segment Internal Insulation Observations:		
	Yes	No
A. Abnormal Erosion?	☐	☒
B. Gas Paths?	☐	☒
C. Ply Separations?	☐	☒
D. Abnormal Blisters?	☐	☒
E. Abnormal Cuts or Gouges?	☐	☒
F. Foreign Material Within Insulation?	☐	☒
G. Liner Completely Missing? (Center Segments Only)	☐	☒
Notes / Comments		
Preliminary PFAR(s)? ☐ Yes ☒ No		
Preliminary PFAR Number(s): _____		

Clarification Form(s)? ☐ Yes ☒ No Clarification Form Page No.(s): _____

POSTFLIGHT OBSERVATION RECORD (PFOR) A-2
Segment Internal Insulation Condition (After Low Pressure Rinse)

Motor No.: 360T025	Side: Right (B)	Date: 19 NOV 92	
Assessment Engineer(s)/Inspector(s): <u>Res Mackley</u>			
Segment: Aft Center			
Segment Internal Insulation Observations:			
	Yes	No	Comment #
A. Abnormal Erosion?	<u> </u>	<u> / </u>	<u> </u>
B. Gas Paths?	<u> </u>	<u> / </u>	<u> </u>
C. Ply Separations?	<u> </u>	<u> / </u>	<u> </u>
D. Abnormal Blisters?	<u> </u>	<u> / </u>	<u> </u>
E. Abnormal Cuts or Gouges?	<u> </u>	<u> / </u>	<u> </u>
F. Foreign Material Within Insulation?	<u> </u>	<u> / </u>	<u> </u>
G. Liner Completely Missing? (Center Segments Only)	<u> </u>	<u> / </u>	<u> </u>
Notes / Comments			

46C-10

Preliminary PFAR(s)? / Yes No

Preliminary PFAR Number(s): 46C-06 J.F.
2 DEC 92

Clarification Form(s)? Yes / No

Clarification Form Page No. (s):

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-3
Forward Segment Liner Pattern (Data Collection Only)

Motor No.: 360T025	Side: Right (B)	Date: 10-26-92
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Assessment Engineer(s)/Inspector(s): Carnell Johnson

Sketch Forward Segment Liner Pattern Observations Below:

	FORWARD FACE OF FORWARD DOME	FACTORY JOINT <321.4>	FACTORY JOINT <161.4>	FLAP BULB	FLAP <0.0>
180°	<!-- Grid for observation sketch --> average { 2" 10' Liner Heavy				
90°					
0°					
270°					
180°					

<Location From End of Tang>

180°
270° 0° 90°

AFT LOOKING FORWARD

Heavy Liner

Light (spotty) Liner

No Liner

Tang End

Clarification Form(s)? ☐ Yes ☒ No Clarification Form Page No.(s): _____

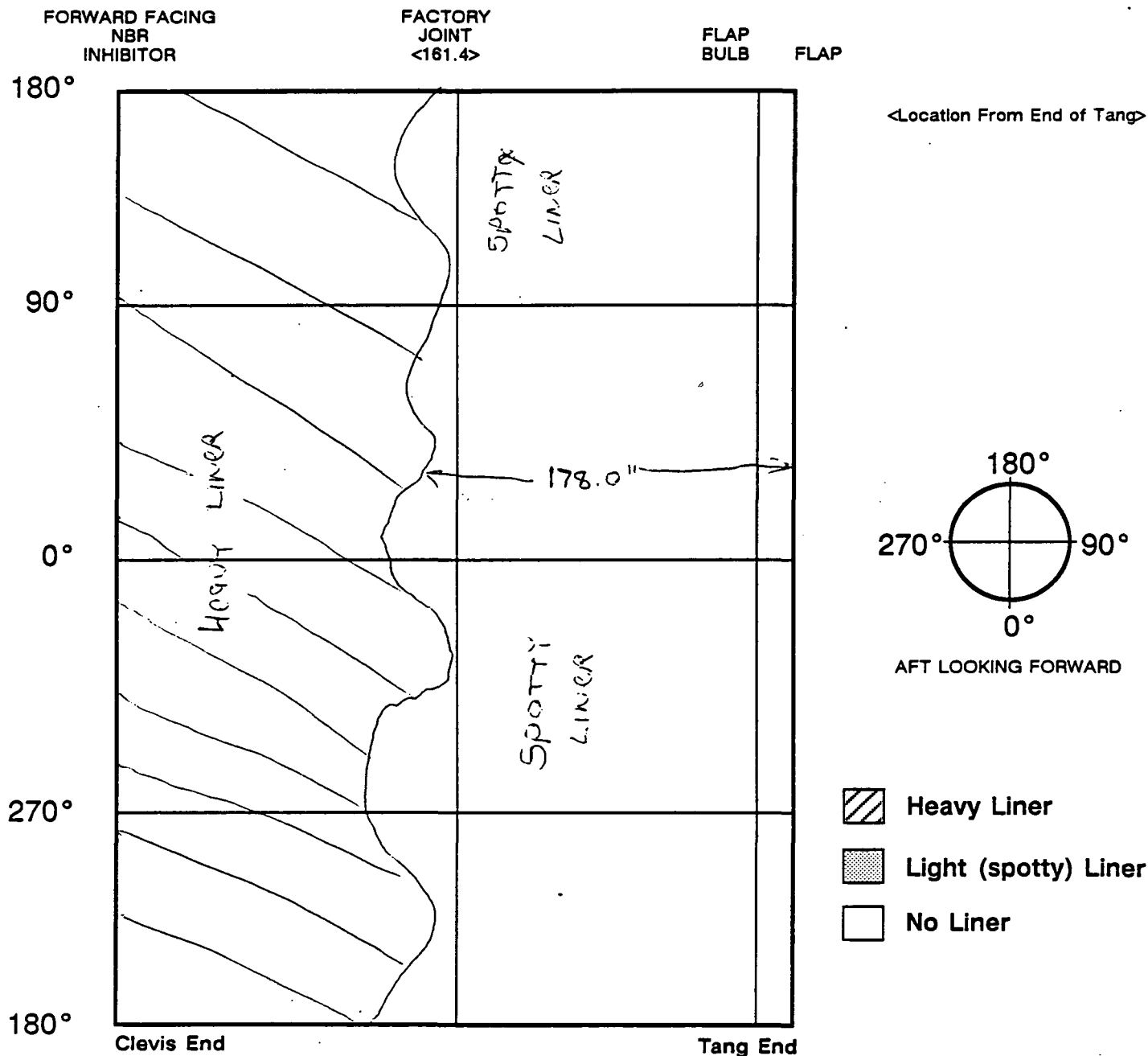
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POSTFLIGHT OBSERVATION RECORD (PFOR) A-4
Forward Center Segment Liner Pattern (Data Collection Only)

Motor No.: 360T025	Side: Right (B)	Date: 1-28-93
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Assessment Engineer(s)/Inspector(s): *Scott Spencer*

Sketch Forward Center Segment Liner Pattern Observations Below:



Clarification Form(s)? ☐ Yes ☐ No Clarification Form Page No. (s): _____

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-5
Aft Center Segment Liner Pattern (Data Collection Only)

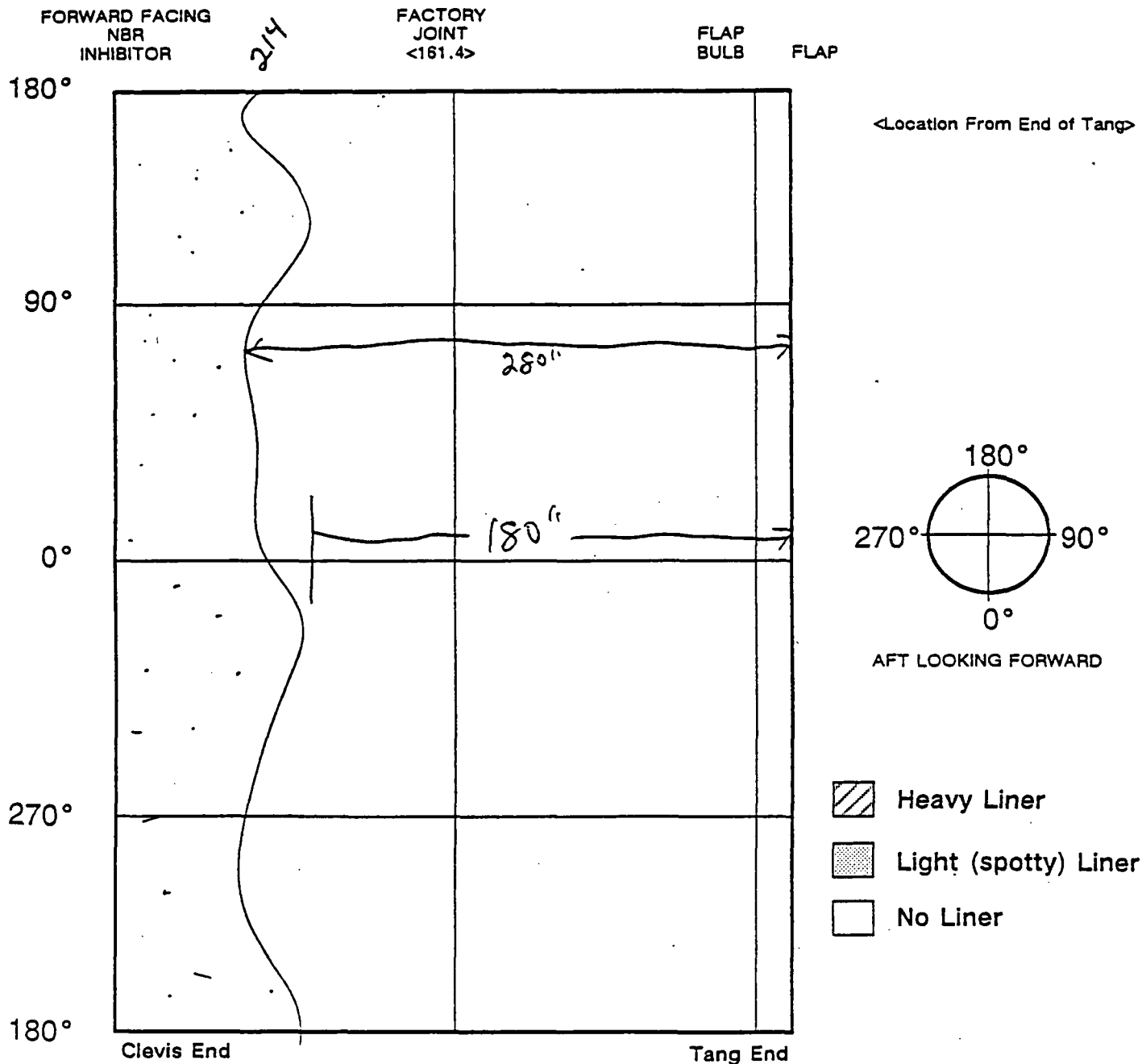
Motor No.: 360T025

Side: Right (B)

Date:

Assessment Engineer(s)/Inspector(s): Shaw

Sketch Aft Center Segment Liner Pattern Observations Below:



Clarification Form(s)? ☐ Yes ☒ No

Clarification Form Page No.(s): _____

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POSTFLIGHT OBSERVATION RECORD (PFOR) A-6
Aft Segment Liner Pattern (Data Collection Only)

Motor No.: 360T025	Side: Right (B)	Date: 10-8-92
Assessment Engineer(s)/Inspector(s): <u>Thalman</u>		
Sketch Aft Segment Liner Pattern Observations Below:		
FORWARD FACING NBR INHIBITOR	FACTORY JOINT <88.4>	FACTORY JOINT <208.4>
FACTORY JOINT <328.5>	AFT FACE OF AFT DOME	

180°

90°

0°

270°

180°

<Location From End of Clevis>

180°
270° 90°
0°

AFT LOOKING FORWARD

Heavy Liner

Light (spotty) Liner

No Liner

Clevis End

NO LINER

Clarification Form(s)? ☐ Yes ☒ No Clarification Form Page No.(s): N/A

REVISION _____

General Hardware Clarification Form

Motor No.: 360T025	Side: ☐ Left (A) ☐ Right (B)	Date: 10-30-92
Assessment Engineer(s)/Inspector(s): MART COOK		
Description: TPS REMOVAL SPECIAL ISSUE		
Sketch Observations Below (include locations and sizes of sketched features):		
Special Issue 3.1.2		
CORK WAS REMOVED FROM:		
- RSRM-25 LH FORWARD CENTER SEGMENT - FORWARD GEI CORK RUN - 190-230 DEGREES - RSRM-25 LH AFT SEGMENT - FORWARD GEI CORK RUN ON AFT STIFFENER CYLINDER - 320-360 DEGREES - RSRM-25 - FOUR FEET MINIMUM FROM TWO ADDITIONAL GEI CORK RUNS FROM TWO DIFFERENT SEGMENTS.		
BONDLINE INSPECTIONS SHOWED ALL REMOVED CORK WAS WELL BONDED. ALL CORK REMOVAL WAS COHESIVE CORK SEPARATION		

Corresponding Comment Number(s): _____

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