

**Factual Report – Attachment 13**

**BED Fuel Analysis**

**OPERATIONAL FACTORS**

CEN17MA183



The Most Trusted Wings In Aviation™

# Aircraft Accident - Fuel Quality Assurance Review

Our goal is simple...deliver clean, dry, on spec fuel every time.

### FBO Information

JET AVIATION BED (BED)  
380 HANSCOM DRIVE  
BEDFORD, MA 01730  
Site ID Nbr: 867104

### Marketer QA Representative

ASCENT AVIATION GROUP INC  
REED FULLER - QC MANAGER  
OFFICE: [REDACTED] CELL: [REDACTED]  
[REDACTED]@[REDACTED].com

### FBO QA Inspection Contact

KYLE GILLETTE - FUEL FARM SUPERVISOR  
OFFICE: 781-[REDACTED] CELL: 000-000-0000  
[REDACTED]

This "Fuel Quality Assurance Review" is for Phillips 66 internal use to confirm the existence of a safe level of compliance with industry standards. It does not constitute a full inspection of the customer's equipment for safety and other purposes, and only includes equipment and procedures directly related to fuel in question. It is intended to identify equipment and/or procedural deficiencies that, if not corrected could contribute to fuel quality issues. It is the customer's responsibility to assure full compliance with local, state, federal and industry standards/regulations.

### Initial

	0	<b>Critical Deficiencies</b>
	0	<b>Deficiencies</b>
	0	<b>Core issues identified</b>
	0	<b>Filtration information complete.</b>
	0 round spouts observed	<b>Duckbill spouts on jet overwing fueling nozzles are a required component of a misfueling prevention program. If local circumstances require the use of round spouts during fueling operations, then site specific policies and practices must be in place to ensure the correct fuel type is delivered into aircraft.</b>
	<b>Aviation Fuel Quality Assurance Requirements Received</b>	

05/15/17	Inspection Date (version 11.7)	Revision Date (if applicable)	<input type="text"/>
05/15/17	Accident Date (P66 use only)	<input type="checkbox"/>	
05/15/17	Process date (P66 use only)		

FBO Representative Title  
Assistant Line Service Manager

Inspection Type  
P66 Accident Review

FBO Representative Name  
Richard Eso

Inspector Name  
Ross Gregson

1 Incomplete Field(s)



Critical deficiencies indicated by red cell color and hatch patterned box to left of cell.



Deficiencies indicated by yellow cell color and black box to left of cell.

**QA Inspection/Review Info**

Yes	Accident QA Review Complete	
11/23/15	Date of Most Recent QA Inspection	
1	# of Deficiencies	
0	# of Critical Deficiencies	
Yes	Compliance Complete	Days to Comply
12/14/15	Date of Compliance	21
Gregson	QCTS Representative	

**Accident Description**

Per Accident Report from the FBO, the aircraft uplifted fuel @ 8:24 on 5/15/17 and departed BED at approximately 10:06. The aircraft crashed on approach to TEB at approximately 15:35. Per information from marketer and news reports, after departing BED, the aircraft flew to Philadelphia and then departed Philadelphia and crashed on approach about a quarter of a mile from TEB.

**FBO Info**

Accident Reported to Phillips 66 By

05/15/17	Date	15:47	~Time
Dorothy Beck	Name		
Ascent Aviation	Company		

**Next Steps**

Fuel will not be tested. No deficiencies were identified on the QA review. Report closed.

**Dealer Contact**

Richard Eso	Name
[REDACTED]	Phone
[REDACTED]	Email

**Accident Details**

N452DA	Tail #		
Learjet 45	Aircraft Type		
	Date	~Time	
	05/15/17	Departure 10:06	
	05/15/17	Accident 15:35	
	Location		
	Hanscom Field Airport (BED) - Bedford, MA		
	Teterboro Airport (TEB) - Teterboro, NJ		
0	# Injuries	2	# Fatalities
Yes	Property Damage		Describe
			Per news report, two industrial buildings caught fire as a result of the plane crash.

**Fuel Details**

Refueler	How was the aircraft fueled?		
Jet A with FSII	Type of Fuel		
Unknown	If Jet, does it contain SDA?		
	Gallons	Date	~Time
	485	05/15/17	8:24
No	Were samples retained?		
2	# aircraft fueled since aircraft in question?		
No	Other fuel related problems reported?		Two aircraft uplifted fuel (2,002 gals.) after accident aircraft and flew with no reported fuel related problems.
Yes	Has fueling been stopped?		After the QA review, dealer indicated intent to resume fuel sales.
16,747	# gallons sold since last receipt?		
No	Sample Fuel?		16,747 gals. combined sales from tank 3 and 4 after receipt of fuel into tank 4 on 5/12/17.
No	After Hours Rush (\$300 additional fee)		
	Sample Qty	Sample Loc	

## Additional QA Questions

Yes Have procedural requirements been reviewed with dealer?

### Sumps

#### Before Fueling Aircraft

05/15/17 Date: most recent sump by Refueler  
 1A Sump Rating

05/15/17 Date: most recent sump (most downstream vessel)  
 1A Sump Rating

#### After Fueling Aircraft

05/15/17 Date: most recent sump  
 1A Sump Rating Refueler

5/15/2017 Date: most recent sump  
 1A Sump Rating (most downstream vessel)

### Differential Pressure (DP)

4.0 (PSI) Observed Differential Pressure  
 GPM - Observed Flow Rate  
 GPM - 100% Flow Rate  
 PSI - Corrected Differential Pressure

#### Before to Fueling Aircraft

05/15/17 Date (most downstream vessel)  
 4.0 DP (corrected for GPM)

#### After Fueling Aircraft

05/15/17 Date (most downstream vessel)  
 4.0 DP (corrected for GPM)

Yes Are DP results being recorded?  
 No Sudden increases or decreases in the last 30 days?

### Nozzle Screen

#### Before Fueling Aircraft

04/19/17 Date: most recent check  
 Good Condition  
 Yes Free of Debris

#### After Fueling Aircraft

05/15/17 Date: most recent check  
 Good Condition  
 Yes Free of Debris

### Other

No Does terminal need to be notified (potential issues with gravity, shelf life, additive, color)?

No Does carrier need to be notified (gravity, additive, color)?

# Aviation Fuel Quality Assurance Requirements

*Our goal is simple...deliver clean, dry, on spec fuel every time.*

Version 10-28-2015



**ALL PHILLIPS 66 BRANDED FBOs MUST ADHERE TO THE FOLLOWING REQUIREMENTS**

## Records & Documentation

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- Develop and maintain a site specific operations and maintenance manual covering facility policies and procedures
- Maintain, at a minimum, the following records:
  - Receipt of fuel
  - Quality assurance test results
  - Equipment maintenance
  - Filter element model numbers and last change dates for all filter vessels
  - Line Service Technician Training
- Retain records and documentation as needed to satisfy customers, suppliers or applicable authority having jurisdiction

## Fixed & Mobile Equipment

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### Storage Tanks

- Dedicated to a single type and grade of product
- Placarded properly for fuel type and grade
- Sump drain or sump pump required on all tanks

### Filtration

- Particulate and water filtration required downstream of the fuel farm, on refuelers and on dispensers

	Coalescer/Separator	Monitor
Jet A	✓	✓
Jet A with FSII	✓	✗
Avgas	✓	✓

- Water defense system (float or probe) required on coalescer/separators into aircraft
- Sump drain required on all filter vessels
- Differential pressure gauges required on all filter vessels
- Placards on or near filter vessel indicating:
  - Element model numbers
  - Date elements last changed and next change due date

### Fueling Hoses & Nozzles

- Fuel hoses must be Energy Institute (EI) 1529 compliant
- Duckbill spouts on jet overwing fueling nozzles are a required component of a misfueling prevention program. If local circumstances require the use of round spouts during fueling operations, then site specific policies and practices must be in place to ensure the correct fuel type is delivered into aircraft.
- Nozzle screens required on all nozzles
- Dust covers or other protective devices required on all nozzles

# Aviation Fuel Quality Assurance Requirements

Our goal is simple...deliver clean, dry, on spec fuel every time.

Version 10-28-2015



## Procedures

### Receipt of Fuel

- Prior to accepting fuel delivery:
  - Sump storage tanks and filter vessels
  - Confirm correct fuel type and grade
  - Confirm bill of lading (BOL) date is within 6 months of certificate of analysis (COA) date
  - Perform white bucket test to confirm fuel is free of particulate and water, and check for unfamiliar odor or color
  - Perform API gravity (corrected to 60° F) test to confirm within +/- 1° of BOL gravity
  - Confirm FSII concentration is within 0.10 to 0.15 volume %
- After accepting fuel delivery:
  - Allow storage tanks to settle (**Jet A: 1 hour** per foot : **Avgas: 15 minutes** per foot)
  - Sump storage tanks and filter vessels prior to dispensing fuel

### Fuel Inventory

- Manage so inventory does not exceed maximum shelf life of 9 months with no fuel added

### Defueled Product

- Must remain segregated from branded fuel and cannot be stored or sold as branded fuel

*Recommended    Required*

### Fuel Sampling & Testing

- Perform white bucket test to confirm fuel is free of particulate and water, and check for unfamiliar odor or color
  - Storage tanks ..... *Daily\** ..... *Weekly*
  - Refueler tanks ..... *Daily\** ..... *Daily\**
  - Filter vessels ..... *Daily\** ..... *Daily\**
  - Overwing nozzle samples ..... *Weekly* ..... *Weekly*
- Perform FSII Additive Test ..... *Monthly* ..... *NA*

### Filtration

- Monitor differential pressure (consider flow rate correction) ..... *Daily\** ..... *Weekly*
- Confirm water defense systems shut down properly ..... *Quarterly* ..... *Annually*
- Replace elements per manufacture's guideline ..... *Annually or if* ..... *Annually or if*  
*Performance*      *Performance*  
*Issues*                *Issues*
- Perform Free Water Test (jet only) ..... *Monthly* ..... *NA*
- Perform Filter Membrane Test (jet only) ..... *Monthly* ..... *NA*

### Fueling Hoses & Nozzles

- Check hose condition ..... *Daily\** ..... *Daily\**
- Flush hoses if in sporadic or occasional use ..... *As Needed* ..... *Weekly*
- Nozzle Screens: Inspect, clean, and replace if damaged
  - Overwing ..... *Monthly* ..... *Monthly*
  - Single Point ..... *Monthly* ..... *Quarterly*

*\* Prior to first fueling of the day*

# Aviation Fuel Quality Assurance Requirements

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Version 10-28-2015



## Training

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Line service technicians shall, at a minimum, receive on the job training and complete the required training listed below, prior to performing unsupervised line service operations and in any event, no later than 30 days after hire date. Recurrent training shall be completed as prescribed below.

*Recommended*    *Required*

### TrustedFuel.com Online

- View QC Training Videos ..... *Annually* ..... *Annually*
  - White Bucket Test
  - API Gravity Test
  - Free Water Test (jet only)
  - Filter Membrane Test (jet only)
  - Fuel System Icing Inhibitor (FSII) Test (jet only)
  - Nozzle Screen Inspections
- Review Documents ..... *Annually* ..... *Annually*
  - Phillips 66  
    *"Aviation Fuel Quality Assurance Requirements"*
  - Energy Institute (EI) 1597  
    *"Procedures for Overwing Fueling to Ensure Delivery  
    of the Correct Fuel Grade to an Aircraft  
    Misfueling Prevention"*

### NATA Safety 1st and ACE LinePro Training

- NATA: Refueling Training ..... *Annually* ..... *Annually*  
    or  
    ACE: Aviation Fuel Quality Control
- NATA: Professional Line Service Training ..... *Every 2 Years* ..... *NA*  
    or  
    ACE: Line Fuel Service Training
- NATA: Line Service Supervision & Training Management ..... *Every 2 Years* ..... *NA*  
    or  
    ACE: Fuel Safety Supervisor Training



### Phillips 66 Aviation Fuel Quality Assurance Program

Quality assurance requires ongoing activity to monitor/manage aviation fuel from the time it is received at the airport until delivered into the aircraft.

Please acknowledge compliance of the following by checking the boxes at the right.

<b>Aviation Fuel Quality Assurance Requirements</b> I have reviewed and agree to adhere to the Phillips 66 Aviation Fuel Quality Assurance	<input type="checkbox"/>
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<b>Congratulations ! Zero deficiencies were identified.</b>	<input type="checkbox"/>
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<b>FSII Additive Injection Equipment</b> FSII additive storage and injection equipment is maintained per manufacturer guidelines.	<input type="checkbox"/>
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_____		_____	
FBO Contact Signature		Marketer/Account Rep Signature	
_____		_____	
Print Name	Date	Print Name	Date



**Facility Information**

Ship To #	867104		JET AVIATION BED
Ship To Name	JET AVIATION BED		JET AVIATION BED
Sold To #	10001342		10001342
Physical Address	380 HANSCOM DRIVE		380 HANSCOM DRIVE
City	BEDFORD		BEDFORD
State	MA		MA
ZIP	01730		01730
Airport ID	BED		BED
Type	AVMD		AVMD
Marketer Name	ASCENT AVIATION GROUP INC		ASCENT AVIATION GROUP INC
P66 Account Rep	Dennis Stafford		DENNIS STAFFORD
P66 QA Rep	Ross Gregson		ROSS GREGSON

**FBO QA Inspection Contact**

Same As

Name	BOB BIZZARO	Kyle Gillette	KYLE GILLETTE
Title	FUEL FARM SUPERVISOR		FUEL FARM SUPERVISOR
Office Phone	7 [REDACTED]	[REDACTED]	[REDACTED]
Cell Phone	[REDACTED]	[REDACTED]	[REDACTED]
Email		[REDACTED]	k [REDACTED]

**QA Compliance Contact**

same as

Name	Reed Fuller		REED FULLER
Title	QC Manager		QC MANAGER
Office Phone	[REDACTED]		[REDACTED]
	[REDACTED]		[REDACTED]
	[REDACTED]		[REDACTED].com

**TrustedFuel.com Website**

Same As

Name			
Title			
Office Phone			
Cell Phone			
Email			

**NATA Safety 1st Contact**

Same As

Name			
Title			
Office Phone			
Cell Phone			
Email			

Tab/Section/Sub Section	Notes
<b>General Comments</b>	QA review covered only the equipment involved in fueling the accident aircraft.
<b>Jet Fuel Farm 1</b>	
Transport to Storage/Refueler	
Filtration	Filter element model #s: I-633C5TB, SO-430C
<b>Jet Refuelers</b>	
Filtration	
Elements	Filter element model #s: CAA33-5SB, SS436-FB5

# Equipment Inventory

## Fuel Farm 1

Notes

	Jet	Avgas
<b>Product</b>	Jet A	Not Applicable
# Tanks	1	
Refuelers	Yes	
Aircraft Fueling Dispenser	0	
FSII Injection Equip	Mounted on Refueler	
<b>Filtration / Relaxation Vessels</b>		
Transport to Storage	Yes	
Vessel Count	2	
Storage to Refueler	YesTransStor	
Vessel Count	Not Applicable	
Storage to Aircraft	Not Applicable	
Vessel Count	Not Applicable	

**Note:** Mobile storage tanks should be recorded as both tanks and refuelers.

**If 1 Mobile Tank:**  
Record as 1 tank and 1 refueler on Farm 1.

**If 2 Mobile Tanks:**  
Record as 1 tank and 2 refuelers on Farm 1 and 1 tank on Farm 2.

**Note:** Look for additional filtration inside cabinet.

**Documents Available**

"Aircraft Accident Reporting" placard

Aviation Fuel Quality Assurance Requirements

Revised Date

Jun 2015

Oct 28, 2015

**Receipt of Fuel Records**

Jet A

Notes

	Bill of Lading	Certificate of Analysis
Date (most recent bill of lading)	05/12/17	05/11/17
	Product is 0.1 mths old (shelf life is 9 mths).	
<b>API Gravity</b>		
Gravity on BOL	47.1 A	
Observed Temperature	68.0	
Observed Gravity	47.8	
Observed Gravity Corrected to 60° F	47.3 B	Inspector API Calculation 47.1 C
<b>Gravity Validations</b>		
Gravity on BOL vs Observed Gravity	OK A vs B	OK A vs C
<b>White Bucket</b>		
Particulate Rating	1-Clear	
Moisture Rating	A-Bright	
<b>Fuel System Icing Inhibitor (FSII)</b>		
Presence of FSII Indicated on BOL	Not Applicable	
BOL: Fuel Gross Gallons	Not Applicable	
BOL: FSII Gallons	Not Applicable	
Computer FSII Calculation (vol%)		Acceptable range: .10 to .15 vol%

No Avgas

Notes

	Bill of Lading	Certificate of Analysis
Date (most recent bill of lading)		
<b>No Product Selected</b>		<b>No Product Selected</b>
<b>API Gravity</b>		
Gravity on BOL		
Observed Temperature		
Observed Gravity		
Observed Gravity Corrected to 60° F		Inspector API Calculation C
<b>Gravity Validations</b>		
Gravity on BOL vs Observed Gravity		
<b>White Bucket</b>		
Particulate Rating		
Moisture Rating		

## Storage Tank(s)

### Tank Information

Notes

#### Tank 1

Identification #

Single Product / Labeled

Fill Point Properly Labeled

Type

Size (gallons)

### Water Management

Notes

Determination Method

Removal Method

### Field Tests

Notes

FSII Concentration (vol%)

Confirm FSII (vol%)

"WB" 1st Particulate Rating

"WB" 1st Moisture Rating

"WB" 2nd Particulate Rating

"WB" 2nd Moisture Rating

Transport to Storage/Refueler

**Filtration**

Notes: Filter element model #s: I-633C5TB, SO-430C

**Elements**

	Vessel 1	Vessel 2
Vessel at Dispenser	Not Applicable	Not Applicable
Element Type 1 - Model #	I [C]	Relaxation
Element Type 2 - Model #	SO [S]	Not Applicable
Element Type 3 - Model #	Not Applicable	Not Applicable
Compliant Filtration	Yes	No
Configuration	NA	Series
Element Changed - <b>Month</b>	OCT	Not Applicable
Element Changed - <b>Year</b>	2016	Not Applicable
Date Posted on Vessel	Yes	Not Applicable

**Appurtenances**

Notes:

Sump Drain Functional	Yes	Yes
DP Gauge	Funct - Direct Read	Not Applicable
Water Defense Equipment	Float / Probe	Not Applicable

**Field Tests**

Notes:

"WB" 1st Particulate Rating	1-Clear	1-Clear
"WB" 1st Moisture Rating	A-Bright	A-Bright

# Jet Refuelers

Select Count

1

Start

Refueler(s) ID-Gal

55796-5000

## Refueler Information

Notes

### Refueler 1

Identification #

55796

Single Product / Labeled

Single  
Prod/Labeled

Size (gallons)

5,000

## Water Management

Notes

Sump Drain

Yes

## Field Tests

Notes

FSII Concentration (vol%)

0.103

Confirm FSII (vol%)

Not Applicable

"WB" 1st Particulate Rating

1-Clear

"WB" 1st Moisture Rating

A-Bright

"WB" 2nd Particulate Rating

Not Applicable

"WB" 2nd Moisture Rating

Not Applicable

## FSII Injector

Notes

### FSII Concentration Calculator

FSII Units	ml
FSII Amount	390
Fuel Amount (gal)	100
FSII (vol%)	0.103

## Desiccant Filter

on Primary Storage

Present - Charged

on Refueler FSII Tank

Present - Charged

## Refueler to Aircraft

### Filtration

Notes

Filter element model #: CAA33-5SB, SS436-FB5

### Elements

#### Refueler 1

Element Type 1 - Model #

CAA [C]

Element Type 2 - Model #

SS [S]

Element Type 3 - Model #

Not Applicable

Compliant Filtration

Yes

Element Changed - Month

MAR

Element Changed - Year

2017

Date Posted on Vessel

Yes

### Appurtenances

Notes

Sump Drain Functional

Yes

DP Gauge

Funct - Direct  
Read

**Jet Refuelers**

Select Count

1

Start

*Refueler(s) ID-Gal*

55796-5000

Water Defense Equipment

Float / Probe

**Field Tests**

Notes

"WB" 1st Particulate Rating

1-Clear

"WB" 1st Moisture Rating

A-Bright



Refueler(s) ID-Gal

55796-5000

Hoses/Nozzles

Notes

Refueler 1

Single Point - Front

API 1529 Hose

Yes

Dust Cover/Protective Device

Yes

Nozzle Screen Condition

Good

Free of Debris

Yes

Over Wing - Front

Yes

API 1529 Hose

Yes

Dust Cover/Protective Device

Yes

Nozzle Type

Duckbill

Nozzle Screen Condition

Good

Free of Debris

Yes

"WB" 1st Particulate Rating

1-Clear

"WB" 1st Moisture Rating

A-Bright

Additional Nozzle

Overwing

API 1529 Hose

Yes

Dust Cover/Protective Device

Yes

Nozzle Type

Duckbill

Nozzle Screen Condition

Good

Free of Debris

Yes