



U.S. Department
of Transportation
**Federal Aviation
Administration**

Technical Center

Atlantic City Int'l Airport
New Jersey 08405

June 24, 1994

Dear International Aircraft Materials Fire Test Working Group Members:

Enclosed please find a copy of the Minutes/Information package from the June 7-8, 1994, working group meeting held at the Federal Aviation Administration (FAA) Technical Center.

This package also contains information and registration forms for the October 4-5, 1994, meeting which will be hosted by Deutsche Aerospace Airbus in Hamburg, Germany. Please note that you must make your hotel reservations directly with the hotel by August 31. Also, the Meeting Registration Form must be returned via fax or mail to April Horner by Wednesday, August 31, as well.

A reminder to those that are participating in one of the four Task Groups, please be sure to complete any task assignments as outlined during your individual meetings on June 8.

We look forward to seeing you in October.

Sincerely yours,

A handwritten signature in black ink that reads "Richard G. Hill".

Richard G. Hill
Program Manager

Enclosure

LIST OF ATTENDEES
INTERNATIONAL AIRCRAFT MATERIALS FIRE TEST WORKING GROUP MEETING
Held at FAA Technical Center
June 7-8, 1994

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INTERNATIONAL AIRCRAFT MATERIALS FIRE TEST WORKING GROUP MEETING MINUTES

Held at the Federal Aviation Administration (FAA) Technical Center
Atlantic City International Airport, New Jersey

TUESDAY, JUNE 7, 1994

ROUND ROBINS

D. JOHNSON: Gave update on Round Robins (Russian Round Robin, Round Robin on New Furnace). All results were not in at time of meeting. Expect final lab data within one month from meeting date.

Presentation: R. Felder (Schneller): Gave update on Schneller OSU Standard Material Round Robin--Reviewed desired characteristics of standard material, reviewed participating labs' data, reviewed results of FPC Fireblock Material (if you would like to receive a copy of his data, call April Horner at 609-485-4471), reviewed data from Albany International on Albany's panel sample. Albany International will provide test material to any lab interested in participating in a Round Robin. He noted that the intent was to provide a material to check the chamber--this is designed to help the labs by making a material available throughout industry to be used as a standard panel.

Hanns-Joerg Betz (Lufthansa): A material should be defined.

D. HILL: Industry has to be responsible to get what they need. If industry needs a material to send to various labs, then maybe industry should look into this.

Hanns-Joerg Betz: We want a material with constant readings to check our equipment.

D. HILL: The panel is not to be used to calibrate the machine. It is to check what you think is the correct calibration of your machine.

D. JOHNSON: We recommend you keep two calorimeters, one in use and another ready to use.

Information on Hugh Barrett's (Polyplastex United) OSU Standard Panel Round Robin may be requested from him at:

Polyplastex United
13700 58th Street, North
Suite 204
Clearwater, FL 34620
Phone:
Fax:

T. Faulkner (Atlas Electric): Suggested a task group be established on standard panels.

Standard Panel Task Group formed: Chairman-- Pete Brownell (Albany International).

HEAT FLUX TRANSDUCER ROUND ROBIN

D. JOHNSON: Gave background on this Round Robin. A report on the status of this Round Robin will be sent to the group in the near future. Reviewed data on Calorimeter Calibration Comparison for Hi-Cal, Medtherm, and Thermogage calorimeters.

Presentation: C. Brookley (Thermogage): Explained Thermogage's heat flux gauge and took questions from the group.

D. HILL: Suggestion: Form a small task group of 5 or 6 people with varying backgrounds to make some recommendations during new business discussion tomorrow.

NEW PROBLEMS -- ALL TEST METHODS

OSU

D. HILL: Are there any problems maintaining your equipment? Something can be put into the Appendix about the bracket for measuring placement of sample. Any problems with pilots?

No comments from group.

D. HILL: Airflow leakage?

M. O'Bryant (Boeing): Corner uniformity: Does anyone else have a problem like we do?

D. HILL: Uniformity of flux, does anyone else have a problem with this? Are there any other problems on OSU?

T. Faulkner: Are there any problems with wet test meter?

No comments from group.

Al Leitner (Albany International): We are experiencing problems with the software. We get problems with the computer hanging up. We have tried the software on two different computers. Also, if we run too many tests and have too many files, we lose access to some of the files.

D. HILL: Whose software is it?

Al Leitner: Atlas.

D. HILL: Discuss the problem further with Tom Faulkner.

D. HILL: Does anyone have any questions, comments, or problems with the NBS Smoke Chamber. The new heating unit (from Newport Scientific) is available for everyone to look at.

Member Question: How long does it last?

K. Ahuja (Newport Scientific): I do not know.

S. Campbell (Douglas): When will there be FAA approval on the new heater?

D. HILL: Ask Jeff Gardlin from Northwest Mountain Region when he arrives.

W. Lampa (Deutsche Airbus): From time to time, we have problems with distance of flamelets -- distance between the burner and the test specimen. Can we reduce distance between the burner and the test specimen?

D. HILL: You and Dick Johnson can work on making it more clear in the Handbook that the flame should impinge on the sample in some constant manner. Then we can circulate the statement around to get everyone's comments on it. Are there any other problems with the Chamber?

D. JOHNSON: Does anyone see any change in the pilot size as the test progresses and the pressure in the Chamber builds up?

J. Farrell (Albany International): Yes, I have seen that.

S. Campbell: There is a pressure valve, correct?

D. JOHNSON: Yes, there is.

BUNSEN BURNER TESTS

H. Betz: Foam is a problem for us.

P. CAHILL: With plain urethane foam, it does not matter where the flame is placed.

VERTICAL BUNSEN BURNER TEST

D. HILL: We recommend you run a material centered on the front face.

S. Messina (Govmark): Why was the position of the flame changed from the center?

D. HILL: Because, on the average that was the worst place to put the flame for the majority of the materials used on an aircraft. Now you should center the burner on the front edge of the face.

K. Forest (FAA-Chicago ACO): The Handbook is not clear on this.

D. HILL: Make some comments on your copy of the Handbook draft and send them back to us for consideration.

K. Forest: I will.

J. Peterson (Boeing): As far as what the regulators have said about what you have to do, we have asked them to give us their final word on what is and what is not acceptable for certification purposes. From the Northwest Mountain Region ACO, the position of the flame is on the front face, however, they will accept data from another flame location.

D. HILL: We have to address this issue in the Handbook. We will task Pat Cahill and Karen Forest and whoever else is interested to come up with words to explain why testing on the front face is required.

P. CAHILL: I recently tested some insulation batting material that failed after flame but had no burn length. If you saw the sample and the data would you accept and understand it? Would you accept it as a failure?

From Group: Yes, we would accept it as a failure.

OIL BURNER TESTS - SEAT CUSHIONS AND CARGO LINERS

P. Ryan (Douglas): Is there any data on the effect of chamber size on the effect of seat cushion test results?

D. HILL: We are still compiling the data. We don't have much at the present time.

J. Gentry (Burns Aerospace): Does anyone have any problem getting a stable airflow through the chamber before the test? Would it be feasible to run a Round Robin on a standard configuration?

D. HILL: We have tried over the years, and we have had very little luck running Round Robin tests with Oil Burners. We never get enough labs interested in this type of Round Robin testing. If you would like to chair a group for this, you may.

H. Betz: I propose to make a test using molded foam. These materials have rather constant values.

TASK GROUP UPDATES

D. HILL: The Handbook is being reviewed by the authorities, and we should get it back in about two months (early August) and incorporate changes and publish it. Within a year we would like to put together a section on each of the four Task Groups to inform everyone of acceptable methods of compliance. We would like each of the four Task Groups to start thinking about what they can give us as a methodology to include in the Handbook one year from now.

Task Group #1- Continued Airworthiness (D. Hill/D. Ingerson)

D. INGERSON: Reviewed work he has been doing on continued compliance on seat fire blocking layers. Information he presented on observation of seat fire blocking layers of in-service aircraft is included in this package. He presented the summary of the ATA Survey results (also included in this package).

Task Group #2 - Production Quality Assurance (P. Cahill)

P. CAHILL: Reviewed purpose of her group and its work.

Task Group #3 - Minor Changes to Qualified Material Systems (D. Johnson)

Reviewed data received from a number of Task Group members (Lufthansa, Schneller, and Douglas data).

Task Group #4 - Material Systems Renovation and Repair Procedures (T. Marker)

Reviewed purpose of group and some of the information received from Task Group members.

K. Forest: Maybe we should address the 144 square inch rule in the Handbook for clarification.

Copies of Task Group leaders are included in this package.

WEDNESDAY, JUNE 8, 1994

Morning Session: Individual Task Group met.

TASK GROUP REPORTS

Task Group #1 - Instructions for Continued Compliance (D. Hill/D. Ingerson)

D. HILL: Made a request for airline personnel to participate in this Task Group. Bob Williams (Delta Airlines) and Hanns-Joerg Betz (Lufthansa) will send cleaning procedures for various materials. This Task Group will send a request to Don Collier (ATA) as well. Additional minutes from Task Group are included in this package.

Task Group #2 - Production Quality Assurance (P. Cahill)

Minutes from this Task Group are included in this package.

Task Group #3 - Minor Changes to Qualified Material Systems (D. Johnson)

Minutes from this Task Group are included in this package.

Task Group #4 - Material Systems Renovation and Repair Procedures (T. Marker)

Minutes from this Task Group are included in this package.

T. Faulkner: In the quality control area, is there going to be a way to transmit data to ACO's, etc.

P. CAHILL: Mike O'Bryant (Boeing) will notify ACO's.

M. O'Donnell (Imi-Tech): How many people are qualified to ISO 9000?

K. Forest: The FAA does not recognize that. The information should probably come through the FAA Technical Center or the directorate because I think that we already had something similar in place.

C. Lewis (TCA/iCST): Raised some questions concerning 'production' quality assurance, specifically on how it will be addressed, indicating that, in addition to test equipment quality assurance, it is a primary issue in the total context of 'in-service' compliance. - Production QA/QC is one of the (four) main concerns raised by the FAA/JAA/TCA International Cabin Safety Team (iCST), the objective being to establish what mechanisms need to be in place to ensure the 'flammability' conformity of production articles with the 'qualified' configurations, and to determine if/what type of repetitive flammability testing is necessary.

D. HILL: We will get someone from manufacturing involved. We will make sure someone in manufacturing knows what we are doing.

REPORT FROM OSU STANDARD MATERIAL TASK GROUP - Pete Brownell

P. Brownell: Dick Johnson to calibrate heat flux transducers to establish a baseline for this Round Robin for the following companies:

Schneller
Albany International
GE
Douglas
Boeing

Any other labs interested should contact Pete Brownell at Albany International.

GENERAL DISCUSSION

Member Question: Is there a video for the NBS test?

D. HILL: We should update the videos on the test methods. Let us know if you are interested in being involved in the production of new videos. Let us know what test method you would like to be involved with. Contact April Horner at 609-485-4471, or by fax at 609-485-5796, if you would like to participate.

D. Onderak (Schneller): Heat flux transducer -- are we going to have a Round Robin on incident and absorbed?

D. HILL: Dick Johnson has been working on that Round Robin as he reported yesterday. He will have a summary report completed within the next month or two.

P. Brownell: Would it be possible for each of the heat flux transducer manufacturers to provide a definition of the terms (incident and absorbed) and how they use them?

D. HILL: We did get something like that from each of the manufacturers when we asked them to participate in this Round Robin.

H. Betz: Do you have any idea when the Handbook will be available?

D. HILL: We have sent copies of the draft to all of the FAA ACO's, the Northwest Mountain Region, the JAA, the CAA, and Transport Canada, and we requested responses back to Frank Tiangsing (Northwest Mountain Region) by July 1, 1994. We should have comments from Frank by August 1, and then we plan to make final changes and publish the Handbook.

T. Faulkner: I have had several requests about toxicity from Asia and eastern Europe. Are we ever going to address the toxicity issue?

D. HILL: In the FAA, we do not have a toxicity test or require other than OSU testing.

NEXT MEETING

The next meeting will be hosted by Deutsche Aerospace Airbus in Hamburg, Germany, on Tuesday and Wednesday, October 4 and 5, 1994. More detailed information is included in this package.

OCTOBER 4-5, 1994 MEETING REGISTRATION FORM

INTERNATIONAL AIRCRAFT MATERIALS FIRE TEST WORKING GROUP

The next meeting will be hosted by Deutsche Aerospace Airbus in Hamburg, Germany, on Tuesday and Wednesday, October 4-5, 1994. Please complete this Registration Form and return it to April Horner no later than **Wednesday, August 31, 1994**, so that she has time to prepare the final meeting participants information for submission to Deutsche Aerospace Airbus. Hotel and transportation information are listed on the attached sheet.

PLEASE NOTE: Your passport number is required for security clearance at DA.

PLEASE COMPLETE THE FOLLOWING INFORMATION IF YOU PLAN TO ATTEND:

NAME: _____

COMPANY: _____

PHONE: _____ FAX: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

COUNTRY: _____

PASSPORT #: (MUST BE COMPLETED) _____

FACILITY TOUR:

A one hour tour of the Interior Integration and the AIRBUS A321 Final Assembly Line is planned for the morning of October 5, 1994, (prior to the start of the meeting).

I will participate: YES NO

MEETING TRANSPORTATION:

There will be DA transportation to and from the meeting available on both days.

I will need transportation: YES NO

LUNCH: Will be provided by DA both days.

**RETURN THIS FORM BY FAX BY
WEDNESDAY, AUGUST 31, 1994 TO:**

**APRIL HORNER
FAX: 609-485-5796 or PHONE: 609-485-4471**



U.S. Department
of Transportation
**Federal Aviation
Administration**

OCTOBER 4-5, 1994 MEETING INFORMATION SHEET

INTERNATIONAL AIRCRAFT MATERIALS FIRE TEST WORKING GROUP

HOTEL INFORMATION:

DA has arranged special rates at the two hotels listed below. Please be sure to reference the Reservation Code when making your reservations. Please make your reservations by August 31, 1994.

<p>1. Maritim Reichshof Kirchanellee 34-36 20099 Hamburg Tel: 49 40 24 83 30 Fax: 49 40 24 83 35 88 Reservation Code: FIRETEST Reservation Tel: 49 40 24 83 31 11 Contact: Mrs. Recke DA Rate: DM 199, -- (single room incl. breakfast) <i>This hotel is close to main station.</i></p>	<p>2. Marriott Hamburg ABC-Str. 52 20354 Hamburg Tel: 49 40 35 05 0 Fax: 49 40 35 05 17 77 Reservation Code: FIRETEST Reservation Tel: 49 40 35 05 17 00 Contact: Mrs. Zech DA Rate: DM 220,-- (single room excl. breakfast)</p>
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TRANSPORTATION:

There is a shuttle bus service which connects the airport to the city of Hamburg (main station terminal). Every 20 min. -- takes 25 min -- return ticket DM 12,-- or Taxi: takes 25 min. -- approximately DM 30,--.

QUESTIONS:

If you have any questions, please feel free to contact Mrs. Catrin Menke in Protocol and Corporate Liasons at DA at telephone 49 40 74 37 22 51 or fax 49 40 74 37 22 98.

AIRCRAFT MATERIALS TASK GROUP #1
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Task Group Leader: Richard Hill
 June 8, 1994

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AIRCRAFT MATERIALS TASK GROUP #1
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Task Group Leader: Richard Hill
 June 8, 1994

TASK GROUP ATTENDEES

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AIRCRAFT MATERIALS TASK GROUP #2
PRODUCTION QUALITY ASSURANCE

Task Group Leader: Pat Cahill
 Established February 2-3, 1994

TASK GROUP MEMBERS

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AIRCRAFT MATERIALS TASK GROUP #3
MINOR CHANGES TO QUALIFIED MATERIAL SYSTEMS

Task Group Leader: Richard M. Johnson
 June 8, 1994

TASK GROUP ATTENDEES

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	See original list attached also	PHONE: FAX:
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		PHONE: FAX:
		PHONE: FAX:

CONTINUED COMPLIANCE

Fire Blocking Layers on Aircraft Seats

I. OBSERVATIONS OF IN-SERVICE AIRCRAFT SEAT FBLs (ACY and PHL)

- Air carrier types : commuter, charter, and long haul (30 seats per carrier)
- Aircraft seat locations : Aisle, center, window, forward, middle, and aft
- Noted observations : Penetrations, surficial wear/staining, and loose contamination

II. MATERIAL TESTING OF FBLs

- | | |
|---|--|
| <ul style="list-style-type: none">• Acquire used seats (used material) from willing ATA respondents• Put working oil burner in place (Bldg 203)• Burn materials• Compile results | <p>(This track used if compliance problem(s) exist)</p> <ul style="list-style-type: none">• Acquire new material identical in composition as the used material• wear the new material (evaluate existing rules of thumb)• Burn the "worn" material• Compile results |
| <ul style="list-style-type: none">• Evaluate results• Respond to findings in an appropriate manner | |

III. GATHERING INFORMATION

- ATA questionnaires
- Phone conversations w/ industry representatives (seat mfrs, fabric mfrs, aircraft operators, etc.)

ATA RESULTS

SEAT AND VERTICAL SURFACES

Notes :

1. 22 total respondents
2. some respondents have multiple answers (i.e., group I, II, III or VI totals greater than 22)
3. m&r = maintenance and repair; a block with "same" (same value as block to left) applies to block immediately to the left - NOT the block above

I. Inspection frequencies:

	Seat covers	Seats	Vertical surfaces
A	daily	same	same
B	daily	C check	n/a
C	daily/nightly	C check	n/a
D	daily/nightly	same	A check
E	daily, R check	A check/monthly	same
F	nightly/higher order checks	same	same
G	weekly	C check	same
H	monthly	C check	same
I	quarterly/on condition	same	same
J	preflight/FA	preflight/FD	preflight
K	pre- or postflight	same	same
L	postflight	monthly	postflight
M	350/400 hours	3500/4200 hours	1600 hours
N	~45 days	300-400 hours/1-4 yrs	?
O	120 days	14-16 months	120 days
P	124 days	365/489 days	124 days
Q	456/1824(B747) days	1824 days	same
R	A, B checks	A, ¼ D, ½D, and D checks	B and heavy checks
S	A check	same	same
T	A check	same	same
U	C check/mid C visit	same	C check
V	continuously (?)	~2 months	n/a

ATA RESULTS

II. Maintenance and Repair criteria :

Criteria	Seat covers	Seats	Vertical surfaces
based on condition	21	18	18
other	8	6	2
** breakdown** for "other"	1 - thread mil spec 2 - 10 dry cleans 1 - 4 dry cleans 1 - 15 dry cleans 1 - 30 days	1 - broken 1 - minor damage 2 - OEM, TSO or CMM req's 1 - 5 year cycle 1 - evaluate at heavy checks	1 - minor/major damage 1 - 3 months

"based on condition" has been interpreted to be indirectly defined by the paying customer. Component performance (i.e. seat comfort) and appearance (i.e. new fabrics vs. old, worn, faded fabrics) have been driven by a desire to satisfy and attract the customer. Wear, tear, dirtiness, and/or burns are frequently used for M&R criteria.

III. Procedures affecting fire endurance of components due to M&R :

Procedure	Seat covers	Seats	Vertical surfaces
none	21	18	17
patch	1	-	-
mfr parts	-	2	-
use adhesive	-	1	3
n/a	-	1	2

IV. Guidelines used to maintain continued compliance of seat fire blocking layers :

Guideline	
none	5
component maintenance manual	7
maintenance manual	5
OEM specification/recommendations	2
other	4
** breakdown for "other" **	1 - CAA std # 59 1 - vendor program 1 - meet FAA regs 1 - random test program

ATA RESULTS

PILLOWS and BLANKETS

Notes :

1. 19 total respondents
2. some respondents have multiple answers (i.e., group I, II, III or IV totals greater than 19)
3. quantities of materials for item IV. is indeterminate; tallies based on whether respondents used listed material

I. Standards for purchase:

Pillows

FAR/JAR : 13
No standard : 4
CAA Specification #8 : 1
Furniture/Furnishings, 1988 and '89 : 1
ASTM : 1

Blankets

FAR/JAR : 16
No standard : 3
Japanese airworthiness reg's : 1

II. Maintenance Procedures:

Pillows

Dispose and dry clean case : ALL

Blankets

Dry clean : 12
Launder : 10
Combination : 3

III. Specification for Maintenance Procedure :

Pillows

Have no spec : 16
Have spec : 3

Blankets

Have no spec : 14
Have spec : 5

IV. Materials Used for Pillows and Blankets :

Pillows

Covers :
Cotton : 7
Linen : 1
Filler :
Polyester : 11
Feathers : 5

Blankets

Polyester (and blends) : 6
Modacryl : 7
Wool : 4
Wool blends : 4



Continued compliance of FBLs

General discussion :

- end of life cycle for first generation FBLs
- 11-13 oz/yd² materials used as dress covers provide best performance
- J.Gardlin (FAA,NW) sees continued compliance (service lif of FBL) issue as a front end manufacturer burden
- Alitalia contends with continued compliance through visual inspection of the dress covers and FBLs
- concern over the inability to account for random chemical contamination (soft drinks, alcohol, etc.) in a standard wear test; how willl contamination affect fire endurance?
- viewed CAA video of seat burner tests illustrating continued compliance problem

AvioInterior continued compliance results (G. Modugno):

- in-house testing under the following conditions yielded:

test conditions:

- using 100 hrs on their Squirmin' Herman (~5 yrs in-service)
- covers with 11-13 oz/yd² and varying weaves

results:

- average wear after Squirmin' Herman test
- 10-15% failure rate against the FAA burner test
 - trends: (1)40-60% greater weight loss for used material
 - (2)60-90% greater flame length for used material
- remainder marginally passed

DuPont FBL material search and discussion results (S. Beare):

SUPPLIER	STYLE	FIBER CONTENT	WEIGHT (oz/yd ²)
Dupont	4311	50% Kevlar® 50% Nomex®	6.4
Dupont	4350	58% Kevlar® 42% Nomex®	7.7
DuPont	5450	65% Kevlar® 35% Nomex®	9.2
Southern Mills	747 QNW	100% Kevlar®	8.5
Tex Tech	XT48417R	29%PBI 44% Kevlar® 27% Nomex®	5.5
Tex Tech	4774R	34%PBI 34% Kevlar® 32% Nomex®	6.2
Tex Tech	XD192:26R	28%PBI 42% Kevlar® 30% Nomex®	7.8

Southern Mills (L. Lipscomb) provided information on their FBL product line :

STYLE	FIBER CONTENT	WEIGHT (oz/yd ²)
S/747 QNW	Kevlar/para-aramid batt quilted to T-450 Nomex face cloth	8.5
S/757 with 156 KN scrim	Kevlar/para-aramid fiber needle punched to T-450 Nomex scrim	8.5
S/767 with 156 KN scrim	Kevlar/para-aramid fiber needle punched to T-450 Nomex scrim	6.7
S/740 with 156 KN scrim	Kevlar/para-aramid fiber needle punched to T-450 Nomex scrim	7.4

General discussion:

- no FBL fabric manufacturer recommendations provided for continued compliance to customers; only recommendation is dry cleaning
- isolated instances attempting to identify continued compliance limits
- visual inspection primarily used to detect extensive wear on FBLs
- shelf life of material brought up as a concern; wear life thought to be much less than fire endurance life

Test procedures used by nonaviation groups (C.L. Fouchee) :

- "small scale" standards now used:
 1. Martindale
 2. Beikmann (sp?)
- appearance is primary factor in dress cover maintenance
- dry cleaning can readily inhibit fire endurance of these fabrics

Cleaning procedures and tendencies (J.Davis):

- dress cover is primarily the item cared for in the upholstery/fabric components of seats
- FBLs not dry cleaned as a rule of thumb; discarding/replacement is primary approach
- foam in cushions not changed often

Pillows and blankets

- D.Ingerson (FAATC) provides data gathered from ATA questionnaire
- discussed variations of care/cleaning for pillows and blankets
- determined that no flammability standards apply to these items

Vertical Surfaces

- discussed cleaning/maintenance procedures for interior cabin finishes
- determined there are no established standards for care

Hidden Materials

- pose maintenance/cleaning problems to airline operators; no such people in subgroup
- looking to get operators involved; no ideas otherwise

Assignments

C.L. Fouchee (Albany Int'l) -

- look into acquiring FR foam samples for testing @ FAATC

J. Davis (Accufleet) -

- provide contact to D. Ingerson (FAATC) for further aircraft boardings to perform seat evaluations
- provide blankets for vertical bunsen burner testing

Steve Beare (DuPont) -

- work up cleaning/care recommendations for FBLs and interior cabin surfaces to maintain continued compliance focus

Task Group #2 - Production Quality Assurance
Minutes of June 8, 1994 Task Group Meeting
Pat Cahill- Task Group Leader

Mike O'Bryant representing the Boeing Quality Assurance Labs described the program Boeing follows to ensure quality control.

The task group feels that the OEM's Quality Assurance programs are adequate.

The task group members believe that the individual labs need to enhance quality control. This pertains to equipment, maintenance and personnel, (good lab practice).

Ways suggested to achieve this would be:

1. Quality Control checks (perhaps weekly)
2. Round Robins among the labs on a yearly basis
3. more FAA involvement

I will look into the feasibility of a Round Robin program with emphasis on logistics, suppliers and other regulatory agencies.

This would be a voluntary program.

Task Group #3 Minor Changes to Qualified Materials
Minutes of June 8, 1994 Task Group Meeting
Richard M. Johnson- Task Group Leader

The discussion of 'minor changes' continued and further agreement was reached. Substrate would not be a minor change. Texture, decorations and color would be considered minor changes. This would be limited to the same supplier. Example: A panel in use to have a minor change, ie: color, if the supplier of the original panel does the change, it would probably be acceptable. If the panel is redone by a different supplier, then probably not acceptable (comments?)

This acceptance cannot be done by an overall change. Should be done on a case by case basis, all backed by previous test documentation. Paints that are available are generally good, however, some are unacceptable. The removal of wallpaper from crushed core substrate is difficult or impossible. Adding layers would increase flammability by some degree. Consider simplifying the test procedure for approval.

Another problem discussed concerned interchanging fire blocked seat cushions that have been certified. Example: installing cushions in another aircraft type using the seats that are in that aircraft. Also, in that line of thought, use certified numbers for assemblies/parts between airlines and manufacturers.

It was suggested paint manufacturers certify paints on several substrates. We are fortunate to have an FAA ACO representative with us to keep our mission on the right track. Thanks.

Various paints and piggyback systems were discussed. Input of data from task group members is encouraging and indicates a staggering amount of useful data available to substantiate our mission to reduce testing.

Round Robin test work requires cooperation from all participants, and coordinators need plenty of support. I feel we have an excellent cross section of members, and I'm sure we will support each other to achieve our goals, which leads to this important Round Robin: Schneller will head up a Round Robin for more complex panels to develop a format to present more convincing data for test reduction. Schneller will set format for testing. Participants are: Schneller, Boeing, Albany International, Isovolt, Douglas, and FAA Technical Center.

Another important task was accepted by Hanns-Joerg Betz of Lufthansa. He will look into developing a presentation using recent data involving minor changes.

This will be the first step toward a format to show that small changes do not result in excessive change in test results.

Thank you for your participation, and feel free to contact me at anytime.

SUBGROUP 4: MATERIAL SYSTEMS RENOVATION AND REPAIR

This is a summary of the topics that were discussed during our June 8th meeting.

1. PAINTING/DECORATIVE LAMINATING OF INTERIOR PANELS

The current dilemma that an airline is faced with when altering the interior of their aircraft deals with the inability to obtain an adequate supply of the original types of interior panels needed to run certification tests on. For example, if Airline ABC wants to paint or install new laminate in the interior of several 737s, they must show compliance using the actual paint/base panel or laminate/base panel combination. In most cases this is impossible because the vendor that supplied the original base panel either no longer makes the panel or is no longer in business. In many cases the operator wishes to show compliance by removing an actual in-service panel to be cut up for OSU and NBS testing, but most interior panels are not perfectly flat, so they won't fit in either of these test apparatus, causing further problems.

In order to overcome this problem, several of the operators that have been attending the working group meetings have suggested the use of a common substrate base panel for running similarity tests. For example, in the case of Airline ABC, they could run OSU and NBS tests using the common substrate base panel, and repeat the tests using the paint or laminate over this common substrate base panel. If the test results indicate that the paint or laminate does not cause an increase in the heat release or smoke production on the common substrate, by similarity it should not cause an increase in heat release or smoke production to the in-service panel. The argument for using a common substrate would certainly alleviate some of the problems that the airlines are currently faced with, but it still would not provide exact results for a particular paint or laminate applied over an in-service panel. There still exists the possibility that a certain paint or laminate may react radically different on the in-service panel compared to its reaction on the common substrate.

Another suggestion concerning this problem is to agree on several (at least 3) different types of representative substrates that could be used as standard panels. In doing so, a "history" could be established for different paints and laminates that are applied to these 3 or more standard substrates. For example, if ABC Airline wanted to use a particular decorative laminate over its original interior panels, they could first run OSU and NBS tests with the new laminate over each of the three standard panels. From this, the worst (highest) OSU peak, average heat release, and smoke numbers of the three new laminate/standard panel combinations could be compared to the OSU and NBS data that accompanies the original interior panel. If, for example, the worst of the three new lam/stand panel combinations raised the

OSU peak by 10 and the original interior panel had an OSU peak of 58, then the combination could not be used, since it could potentially raise the OSU peak to 68. The same calculations for the average heat release and smoke production would also have to be considered. In order to qualify the paint or laminate/base panel combination, all three criteria (OSU peak HRR, average HRR, and smoke D_g) would have to be met.

2. CARGO LINER PATCHING/REPAIR

In order to qualify a cargo liner patch/repair, it currently must meet two criteria:

A) the patch material must first be tested as a flat sheet, 16" X 24", in the ceiling position of the cargo liner apparatus (even if the patch is to be used in a sidewall application in service, it still must be tested in the ceiling position). In this position, it must resist burnthrough for 5 minutes and the temperature 4 inches from the backface must not exceed 400°F.

B) The patch must then be tested for adhesion by using a 4" X 4" patch placed over the exact type of liner that it is intended to be used on. This system is then tested in the ceiling position of the cargo liner apparatus to ensure adhesion for 5 minutes.

In addition to the above criteria, it was the recommendation of the subgroup that patches/cargo liner repairs also follow additional guidelines to prevent the patch from failing in service:

a) during the adhesion test, a 5" X 5" X 1" wide "L shaped" void should be removed from the liner, and an 8" X 8" patch should be tested for adhesion over top of the void, instead of the 4" X 4" patch over no void (figure 1). This would make the qualification test more realistic since there is always some degree of damage area under the patch in service. Damage due to rips or tears in cargo liners typically follows the perpendicular axis from the point of puncture, causing an L shaped damage pattern.

b) in addition to the requirement that the patch be tested for adhesion on the exact type of liner that it is intended to be used on in service, there should also be a requirement that the patch be tested for adhesion on the exact thickness as well as type of liner that it is intended for use on. A patch may react quite differently when exposed to intense heat or flames when used on a variety of liner thicknesses because of the difference in resin content. The thicker liners, because of the additional amount of resin, release a significantly larger amount of heat during the test than a thinner liner would. By comparison, the thinner liner contains less fiberglass reinforcement and thereby provides less structural substance for the patch to remain adhered to. These factors may allow a patch to pass the test on a given thickness of liner, but ultimately fail in service on a different thickness liner.

c) the amount of patch overlap beyond the actual damaged area of liner is also critical in ensuring that the patch remain properly attached. The manufacturer must adequately specify this information so that repairs made in areas near edges or corners have sufficient overlap to prevent patch failure. If, for example, a particular patch requires a minimum of 2 inches overlap then it could not be used for repairs that are less than 2 inches from a corner or seam.

d) the most common form of damage that cargo liners experience is rips or tears. In some instances, these tears may be of considerable length, rendering a single patch inadequate to fully cover the damage. When this type of damage is encountered, the only feasible method of repair is to "shingle" several patches over each other to accommodate the damage length. If a patch is intended for this type of use, it must exhibit the ability to remain adhered to itself during the adhesion test. One method of performing this test would be to take two 4" X 4" patches and overlap them in the center of the cargo liner; the width of overlap would be representative of the in-service overlap, as specified by the manufacturer (figure 2).

e) the testing of neoprene coated fabric liner repairs or "soft" liner repairs was also discussed (this type of liner is used primarily as a partition separator, control panel cover, and oxygen tank cover). Repairs made on this type of liner generally consist of a patch of identical material stitched to the liner using fiberglass or teflon thread. In order to qualify a repair of this type, the above guidelines should be followed as well.

3. SMALL PARTS EXCLUSION/PANEL REPAIR/USE OF FILLERS

Currently, many small parts within an aircraft cabin (such as knobs, handles, rollers, fasteners, clips, grommets, rub strips, pulleys, and small electrical parts) are exempt from fire testing on the grounds that they would not significantly contribute to the propagation of a fire as per Appendix F, part I (a)(1)(v). It was a group consensus at the first meeting that small repairs made to interior panels using fillers/filling compounds should also fall under this exemption. The group also cited the "144 square inch rule", which is an unwritten procedure followed by many certification offices which allows for the exemption of fire testing of interior panels of less than one square foot. This procedure is loosely interpreted, therefore several panels that are less than one square foot, but within close proximity of one another would require testing.

This logic is also valid in terms of small repairs made to interior panels using fillers. It is unlikely that a few repairs made to sidewall and stowage bin door panels would render an aircraft interior non-fire safe, but at what point does the interior become more flammable due to an excessive number of repairs? Since the airlines do not keep records of every single

small damage repair made to an interior, there is no way of calculating a "cut-off point" at which further repairs should be prohibited. With this in mind, it may be easier to run tests and establish some pass/fail criteria for the fillers to ensure that the interior flammability would remain as it was initially, regardless of the amount of repairs that have been made.

In order to establish pass/fail criteria, it will be necessary to conduct some OSU and NBS tests using fillers that are currently in use. Fillers are generally used in three consistencies or densities, depending on the type of repair. A "spray" filler may be used for minor imperfections/scratches, a "brush" filler may be used for deeper scratches/dents, and a "spatula" filler would be used to fill large dents/holes/punctures. In order to devise a representative test, the group consensus was that the three types of filler densities should be used in each test panel. This could be accomplished by filling a 2" by 2" void in the 6" by 6" OSU panel and using a 1" by 1" void in the 3" by 3" NBS panel. The ratio of damage area to panel area would be the same for both panels at 1/9. Each panel void would be filled and finished according to the manufacturer's specifications. The initial tests will be conducted at the Tech Center using three brands of fillers: "Bondo", an automotive body filler, Mankiewicz, and HSH Aerospace finish. The fillers will be used in combination with two types of panels which are representative of a sidewall panel and a galley panel, two areas prone to damage. The panels will be supplied by Schneller (sidewall panel), and KLM (galley panel). Subsequent tests will determine the effect of decorative laminate over the repair area.

Additionally, it was requested by the group that the "144 square inch" rule be discussed in the next version of the handbook, in order to establish a more consistent interpretation of this procedure between the various ACO's.

4. OTHER AREAS

No additional information was provided on the types of repairs that are made to seats. The consensus of several operators is that damaged seat covers/fire blocking is replaced, not repaired. Issues involving seat cleaning and continued compliance are covered in subgroup 1.

No information was provided on the repair of vertical carpet surfaces. In the opinion of group participants employed by operators, these areas are replaced if damaged, and in some isolated cases, they are sent out to be cleaned. As with seats, these issues are covered in subgroup 1, continued compliance.

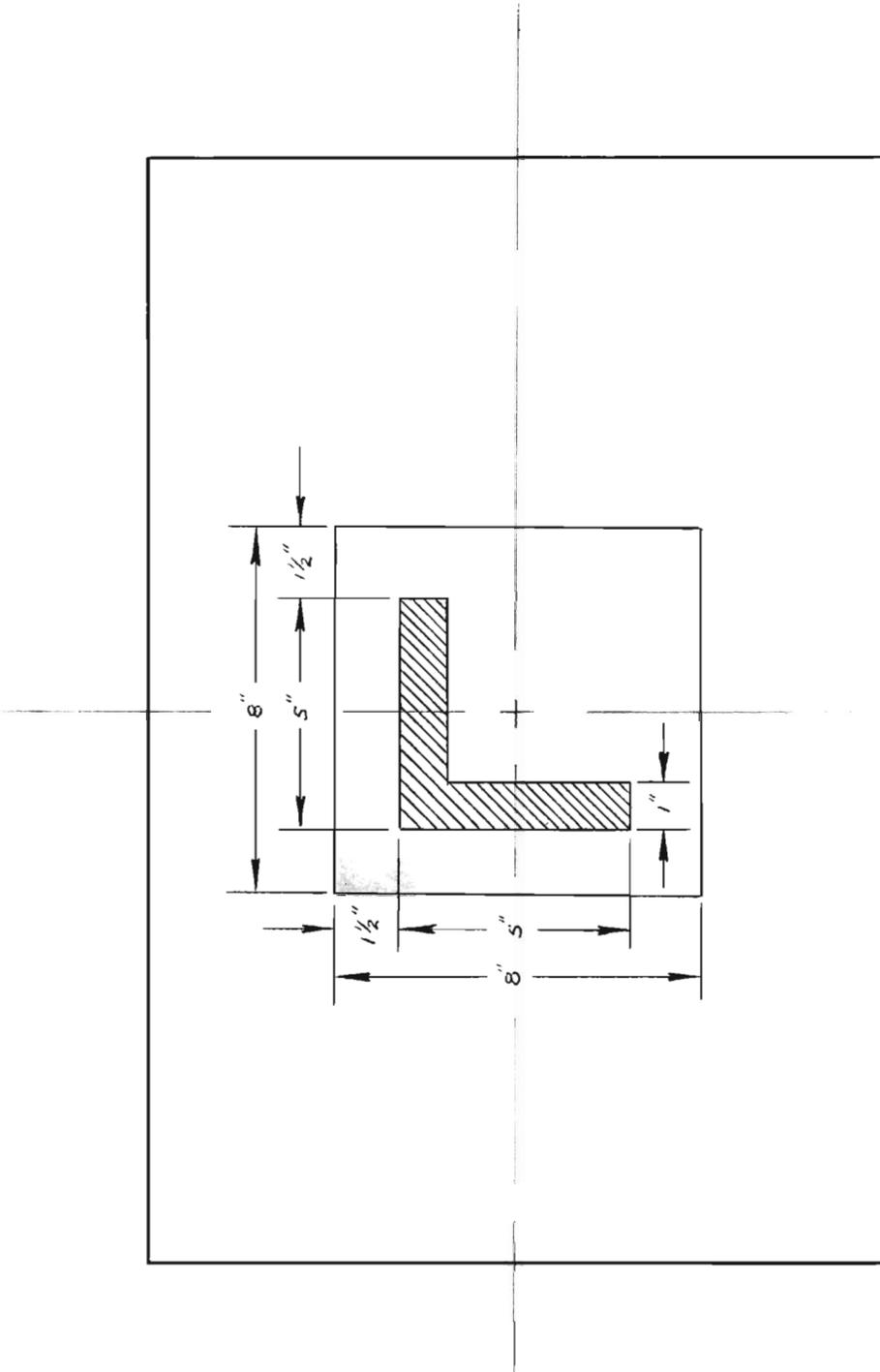


Figure 1

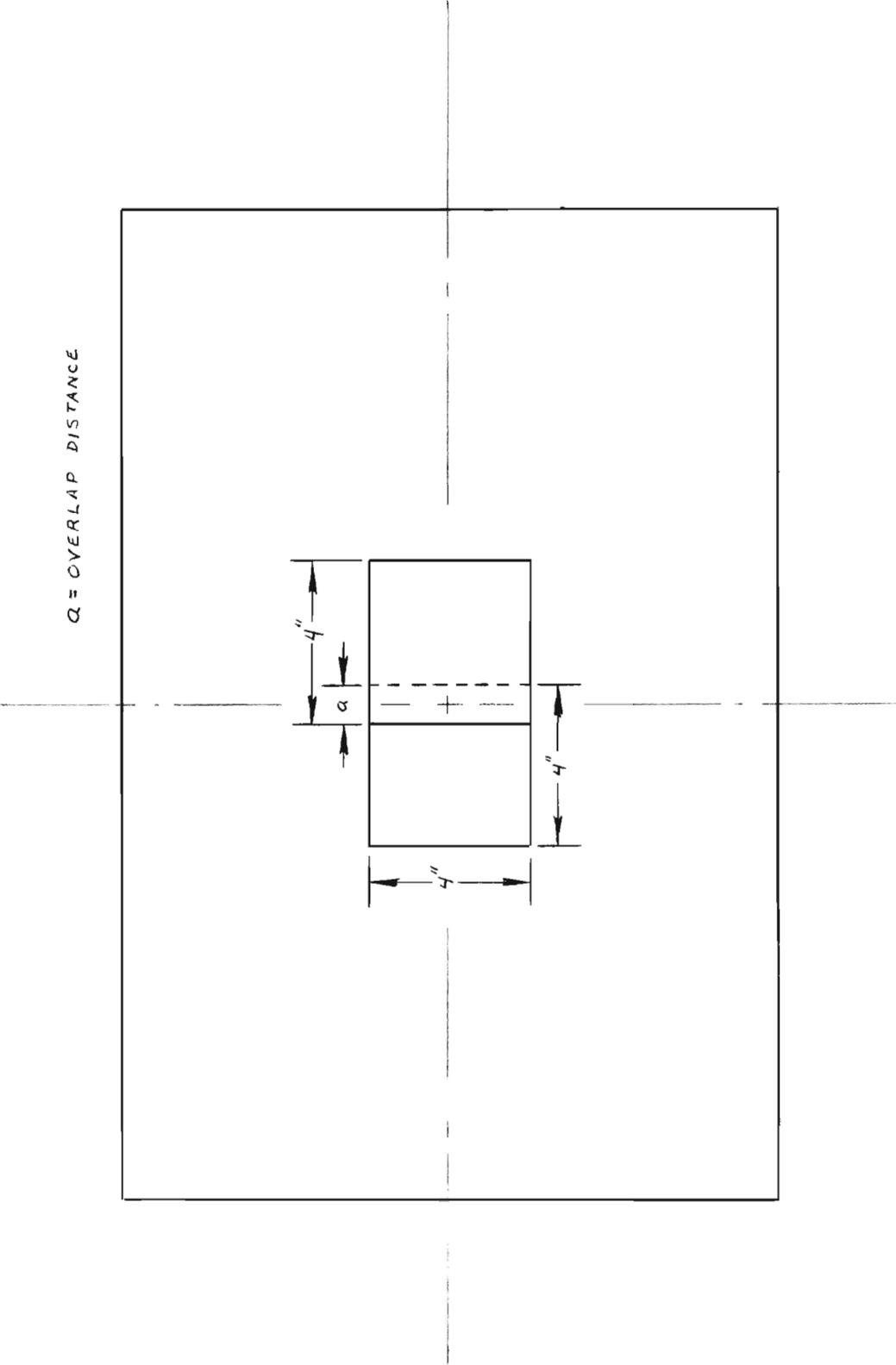


Figure 2



U.S. Department
of Transportation
**Federal Aviation
Administration**

Technical Center

Atlantic City Int'l Airport
New Jersey 08405

Aviation Security
ACA 400, Building 315
June 24, 1994

Dear *International Aircraft Materials Fire Test Working Group Member*:

I would like to inform you that I have been reassigned to the Aviation Security Department.

The work on the Oil Burner Tests for aircraft seat cushions and cargo liner material will now be handled by Doug Ingerson. Those of you who attended the recent working group meeting at the Federal Aviation Administration (FAA) Technical Center had the opportunity to meet Doug and see his presentation on the continued compliance project. I have provided his address and telephone/fax numbers below for your convenience.

FAA Technical Center
Fire Safety Branch/ACD-240, Bldg. 203
Atlantic City International Airport, NJ 08405
Phone #: (609) 485-7354
Fax #: (609) 485-5796

It has been a pleasure working with you, assisting and discussing any problems, questions, or concerns you have had with the oil burner. Please keep up the good work at maintaining aviation safety.

Sincerely,


J. Michael Barrientos