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Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
1	The Technical Loop		All	All		AFR	

Airlines are worried concerning the breakdown of the technical loop. The technical loop is constituted by the OEM, the Airframers, and the Airlines. Since the beginning of civil aviation, this loop has been made of exchange of information between system integrators, component manufacturers, and operators. The three of them are speaking about in-service issues and are working together to find the efficient solution in term of operational impact, keeping safety as the key factor.

Since several years ago, due to the necessary investment to succeed in performing the required level of repair, Airlines have started to build common shops with a pool of components. Technical loop has continued to be effective through major Airlines who have gone on speaking with OEM and Airframers. Nowadays, to keep their standards, the smallest operators can choose to work with OEM or with MRO.

The aeronautic business is changing, the OEMs would like to keep repair and overhaul cash flow for themselves.

If this situation happens, it would impact the Airlines, among other effects; what would become of the technical loop? Airline could not work anymore on their components, could not understand what's occurred inside. OEMs would not feel concerned at all by the consequences that component failures can have on Airline operations and would minimize the issues even more than today. Airframers will lose valuable information from Airlines due to the resulting lack of technical skills. The loop will then be broken over a no return point.

AMC's participants are actors of this loop. SPSA and GPC should consider this technical loop as well. Airframers and Airlines have to work together in a win-win spirit and have to focus on the technical loop necessity. EASA and FAA regulations are totally in accordance with this philosophy, as the rules are implemented for safety.

Airlines, Airframer, and OEM comments, please.

FERREIRA/TAP AIR PORTUGAL – TAP is also concerned about the potential loss of technical information and skills that this scenario can lead to. Not sharing knowledge and experience between operators, OEMs, and airframers will make it more difficult when identifying the root cause of failures and safety issues.

In addition, we have observed that technical visits are being more and more often replaced by what at the end was just a commercial visit.

DEVLIN/AMERICAN AIRLINES – We would like to support Air France on this item. We are experiencing a not so hypothetical situation with a flight control actuator on one of our aircraft. We have gone to the airframer and they have subcontracted out the design of the actuator to Supplier A, who has then subcontracted out the design of this RVDT on the actuator to Supplier B, and it is one of our top delay and cancel drivers for our fleet. We are not able to get information for repair of this device and have been told by the airframer that essentially the design has been subcontracted out and they have no control over it. It is a very frustrating situation for American Airlines.

KOZACEK/DELTA – We as well support this. It is definitely an issue. I think it is felt by every airline in the industry out there where we just have to make sure that we are tied in from the moment the aircraft are built all the way until we quit flying the things. It is very important for us to have that continuity so we can maintain them in the future, maintain our costs, and keep up that reliability. So, we definitely support this.

QUESINBERRY/UNITED AIRLINES – We support American on the same issue with the RVDTs. The components that they have made improvements on, we are still having problems with.

DEAN/DELTA – I wanted to add that a big problem is the OEMs that buy a lot of the smaller companies, they do not maintain the expertise. We have a lot of difficulty when this system is made by a smaller company that was

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purchased by one of the bigger companies and sometimes they do not even have the people that developed that particular part. They lost the expertise and it caused a lot of difficulty.

GLAPA/AIRBUS – Airbus fully supports Air France's statements on the need to maintain the technical feedback loop as a link between the aircraft, operator, supplier, and airframer is important in understanding the equipment behavior, reliability, removal reasons, as well as contributing to quick fixes. Airbus is willing to further develop the technical loop as proposed by Air France with operators and customers; however, the question will remain on how this can be included in the supplier product support agreement, but Airbus will be ready to review and implement processes that may be agreed by the Industry players.

KIMBALL/BOEING – We would also like to thank Air France for their commentary here. We would like to reinforce the point that the technical loop is in fact an excellent description of the maintenance processes made mandatory by a regulatory requirements. Unfortunately, we also have to agree that over the last several years, there has been significant evidence that our maintenance paradigm is tending in the direction that was described here. At every AMC, we discuss the evidence of this shift and will address it repeatedly at this AMC too.

In our opinion, there are two main contributors to this shift. The first is what we have come to refer to as the IP wars, which we will talk about again this afternoon. We are fully aware of the continuing challenge at last year's AMC Intellectual Property Symposium that made painfully clear that it is an increasing problem, and I am sure it will be brought out again today. Essentially, the regulations require that everybody in our industry share this intellectual property for the continued safety of our airplanes. It is not a question of if it is required, it is the law and it is not optional. We need to do this.

To this end, a significant feature of the Boeing sales agreement with our customers and our parts support agreement with our suppliers is to provide the basis for the sharing, control, and protection of intellectual property. In most of these cases, these agreements have proved to be adequate. In certain cases, supplemental agreements may be required, and as we all know, we are not perfect in every situation.

The second one is specifically the law. Again, the operator is required to approve all the maintenance activities. They can not do that if they do not have the data. The repair station is required to perform as directed by the operator, and a manufacturer other than is authorized within an FAA 145 repair station license has no authority to perform any maintenance.

LAGRANGE/ROCKWELL COLLINS – Rockwell Collins believes the technical loop provides us with valuable information to continuously improve our products and that it takes all of us, the operator, airframer, and OEM, working together to understand the cause of highly complex issues. All too often, root cause and corrective actions lie outside the domain of at least two parties in the technical loop, and root cause is never reached or actions that would prevent disruptions to airline operations are delayed or sometimes never taken at all. Rockwell Collins agrees, we need to work together closely to drive improvements in our products and prevent disruptions to airline operations.

As such, Rockwell Collins has a well-established reliability program known as RECAP [Reliability Evaluation and Corrective Action Program]. We collaborate with many operators and OEMs to collect in service data, perform trend analysis, and drive improvements in our products. The knowledge we gain from our RECAP activities are shared with operators through a combination of direct feedback and updates to our documentation.

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Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
2	CMM	Level III Repairs	All	Boeing		KLM	

The current trend is to have independent repair stations perform only level 1 (swapping out boxes) and level 2 (taking out boxes and testing them to filter out no-fault-founds) support. Failed boxes must be sent to OEM for exchange or level 3 (component replacement) repairs.

KLM would like:

1. Current and future CMM's to contain Level III repairs.
2. Current and future CMM's to contain all part number information required to perform Level III repairs.
3. That Level III repairs in CMM's are not limited to OEM parts, but also include information for modules not manufactured by the OEM.

We are interested in hearing comments of other operators, MRO's, vendors, and Boeing.

DUQUE/TAP AIR PORTUGAL – We would like to remind all OEMs that the decision of repair units must be up to the operators. Operators should be provided with a means to evaluate if a unit or part is repairable. OEMs should support all the documentation required from the maintenance on the units. The loss of information will degrade the technical knowledge of units and related failures during operation.

GUILLEMIN/AIR FRANCE – Air France would like to support this issue. Further than performing the Level 3 repairs, the airline must be able to control and approve the work that is found on the component at every level.

KLINK/FEDEX – This question is a good example of how important it is for the operators to understand what the contractual language is with the airframers and suppliers' product support agreements, because depending on who you bought your airplanes from, some of those airframes have those contracts, some of which are better worded than others.

It is important to understand what are the obligations of the supplier to the customer and back to the airframer, as far as providing Level 3 documentation, access to procurable test solutions, and procurable piece parts. So there are a lot of those fundamental things which should be part of those product support agreements. So, it is important that the operators are well versed and engage those organizations within the airframer's vendor police, and it is good to know who those people are and engage them when you need help. Those are the people you go to help encourage suppliers to abide by contractual language in those Product Support Agreements (PSA).

KOZACEK/DELTA – We as well support this because it is very important to us to have those Level 3 manuals out there for everything we work on. Also, one point here that is very sensitive and very important for the airline industry is to have information on subassemblies inside the components that are manufactured by somebody other than the OEM STC holder.

We see that on a regular basis where Delta will have a component and there will be subassembly inside the LRU that is not built by the manufacturer and is subcontracted out. Delta will then try and obtain the CMM and will be informed that they do not have the information to give us.

This is definitely a cost driver for us. We fully support this.

SCHMIDT/LUFTHANSA – We totally support the request of KLM and all the statements we heard from the other operators, as all documentation which is used to repair these units should be available for all operators. We support the question.

DEVLIN/AMERICAN AIRLINES – We would also like to support KLM and agree with the three proposals listed in this item. Also, we agree with Mitch and his statement that although this item tends to appear to reach out to

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the component suppliers, it really also touches the airframers, and we need their assistance on future aircraft programs and the way that product support agreement language is crafted.

THOMAS/BRITISH AIRWAYS – We would like to support this issue as well. One of the problems of the Level 3 is it increases our subcontract cost, and our base costs basically go up. So, we support this.

ITO/JAPAN AIRLINES – We support this issue because the Level 3 CMM is not always available for component maintenance. We completely support the KLM agenda.

KIMBALL/BOEING – To answer KLM's points in order, Boeing requires that Boeing supplier CMMs provide the necessary data to support maintenance to the basic part level, as addressed in **ARINC Report 663:** *Data Requirements for Avionics Maintenance*. Boeing requires that the illustrated parts list in the Boeing supplier CMMs provide a breakdown to that basic part level. For those of you who are not familiar with that, that means that further disassembly results in destruction and can not be reassembled. Both of these above requirements apply to all sub-assemblies and parts of the prime LRU and LRM. Each article, subassembly, or part must be completely detailed in the primary in the prime CMM or correctly referenced in complete subassembly CMMs. We also require and make every effort to ensure that each item subassembly part number is correctly identified by its true manufactured part number. Note that all three of these requirements are also basic minimum ATA requirements for industry standard CMMs, and we believe all CMMs should be held to at least this standard.

As you all know, we are not perfect, so in case any Boeing customers feel that a Boeing CMM does not provide all of the required data or a supplier is not providing you with a level of support you are entitled too, please contact us. We also want to remind everybody about the SCEA meeting and the briefing on that to make sure you pick up these same requirements in the BFE and STC contracts.

GLAPA/AIRBUS – Mr. Chairman, with your permission, Airbus would like to group the answers to question 2 and 3 which has been raised by TAP Air Portugal which had the same kind of issue.

MODERATOR – And those two questions are submitted by KLM and TAP. TAP, do you have any objection to merge item 2 and 3? I see no objection. KLM do you have any objection? So, we can go ahead and answer questions 2 and 3.

GLAPA/AIRBUS – The Airbus support contracts require the suppliers to issue ready-to-use Level 3 repair information in the CMMs for our customers. Airbus also calls for the Level 3 documentation to be made available to the operators who wish to perform maintenance on the equipment and card assemblies or for review to authorize the maintenance provider to perform work on their equipment. As a reminder, Airbus would like to highlight that the general condition of purchase and supplier support conditions require the supplier to provide the Level 3 documentation or to provide a timeline of when the Level 3 documentation will be made available.

KIMBALL/BOEING – Related to question 3, Boeing has noticed this trend of trying to use Abbreviated Component Maintenance Manuals (ACMMS). ATA provides for the abbreviated CMMs for simple or non-complex parts. Unfortunately, this is not well defined actually criteria, but it is relatively easy to resolve. An abbreviated CMM has no requirement for a parts list. Therefore, abbreviated CMMs are only applicable to articles that do not have any replaceable parts. But they are applicable to things that might need servicing or painting or other test checks before they are either scrapped or thrown away or returned to service. It is worth noting that it has been the customary application of these ACMMs for years. It is also customary to assert that ACMMs are only applicable to expendable or non-repairable parts. As I just mentioned, this characterization is not necessarily accurate. They can be used for testing, minor repairs such as refinishing and resurfacing. Boeing makes every effort to ensure that CMMs for SFE products are supported by the appropriate type of CMM. Repairable parts require CMM which provides the operator the adequate information to perform this Level 3 maintenance down to the basic part level. In any case that you are aware of something that is not correct and we have missed that goal, please let us know and we will go work it.

HUBBARD/ROCKWELL COLLINS – Rockwell Collins continues to provide Level 3 repair tests and repair procedures as outlined in the intent of the current ARINC and ATA standards. All Rockwell Collins, Component

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Maintenance Manuals (CMMs) required by aircraft OEMs are written to the component level or Level 3 per the requirements of the support agreements with the OEMs.

WRITTEN - Rockwell Collins continues to develop technical manuals to support level three repairs, where appropriate, and uses all available engineering technical data. In the cases where a second tier supplier part is used, the engineering data provided to Rockwell Collins from the supplier will be used as outlined in the agreements negotiated between Rockwell Collins and the second tier supplier. In addition, all Rockwell Collins Component Maintenance Manuals (CMMs) required by aircraft OEMs are written to the component level or level 3 per the requirements of the support agreements with the OEMs.

Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
3	**Incomplete CMM**	**All**	**All**	**All**	**All**	**TAP**	

Over the years, airlines have been struggling with incomplete information concerning Level 3 repairs included in CMMs. TAP is concerned with the new trend where CMMs are more often being replaced by ACMMs (Abbreviated CMMs) and regular repair chapters are being removed.

Comments from other airlines, Airbus, and suppliers appreciated.

Estimated Annual Cost Penalty: $1,000,000

See Discussion Item #2

********11-001********

Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
	All Components		**All**	**All type**		**DAL**	

14 CFR 145.205 requires repair work accomplished on behalf of an operator with a CAMP to be accomplished per that operator's maintenance program. That maintenance program would include the operator's manuals, work scopes, and other technical documents.

As OEMs get into the MRO business, we are seeing more and more units returned to us with items on the 8130-3 form that are outside of the published manual or our desired work scope. These items include OEM build specifications and ATE items. The use of that data without the operators express permission constitutes a violation of 14 CFR 145.205. When we have approached the OEM MROs for access to that information for evaluation to allow incorporation into our maintenance program, we are frequently hit with barriers under the guise of proprietary data.

Under what regulatory authority do the MROs feel that they can use OEM data without operators consent? What near term solutions are the MROs undertaking to add this content to the published manual system? What precautions are the OEM MROs taking to ensure that the data is not used prior to consent being given by the operators?

Other operator and vendor comments, please.

Estimated Annual Cost Penalty: $50,000

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RENNICK/DELTA – This is a carry-over from last year. We had some good words spoken at the last AMC about how some of our major partners who are OEMs who own MROs were going to change their ways. While some efforts have been made, the progress has been very disappointing on the whole. We are still seeing blockades put up in front of us based on corporate culture: It is not in our policy to share this information with you; therefore, we will not. We have to get to the meat of the data that we need.

We are also still seeing a lack of understanding within the repair stations that are embedded in production facilities that there is a distinct divide between the tasks they are doing. I think we have seen in the questions up to this point, that Delta is not the only one feeling this pain. Delta wants to see change, particularly from our larger partners who we have had extensive discussions with, and we want to see change quickly.

GATES/AMERICAN AIRLINES – I would like to remind that this is not a problem only with the components but actual aircraft piece parts. For instance, PCMCIA cards are becoming harder to get. It is going to be costing quite a bit in the future.

JOZIC/KLM – We are now seeing the same development. There is an article FAA Part 145-205 which requires that you have all the data for the CAMP, required by authorities for approval. However, what we have noticed is that the smaller OEMs, smaller vendors, are willing to provide the data if there is any deviation from the OEM. I assume it is because they do not want any lawsuits nor have numerous lawyers employed.

Larger suppliers, probably they have more lawyers employed, so they are making it more difficult to get all the data from them. That is something that we do not like.

DEVLIN/AMERICAN AIRLINES – We have had some situations where the OEMs have performed repairs on components outside of the CMM limits and then have asked our airline engineers to sign off on the deviation but will not share the repair data with our engineers because of proprietary reasons, and that really puts our engineering staff in a bind and puts them in an uncomfortable position.

KRAMER/US AIRWAYS – We would like to support this question as well.

THOMAS/BRITISH AIRWAYS – We have experienced exactly the same with the OEM doing the repair and asking for us to sign it off before they got the approval to carry out that repair themselves. So we would like to support this issue.

GLAPA/AIRBUS – The Airbus suppliers are required to perform the maintenance on the operators' equipment as per the operator's approved documents. In addition, they are required to reference this information on the repair documentation. Airbus contractual requirements GSP and SSC and the airworthiness requirements refer to the above rule and require the suppliers to publish the data that allows the above to be performed.

KIMBALL/BOEING – As you all know, we discussed this in great detail last year, and we are going to that again this afternoon when we talk about the IP at the symposium, but essentially our discussion from last year remains the same that we believe that FAR 145-205 requires all the repair stations to work to airline approved data based on our understanding of what the federal requirements are for the CAMP and that kind of stuff. The airline has to have possession of that.

The one thing that I would like to caution here though is that for the most part when we are talking about CMMs and those kinds of things, we are talking about maintenance data. When we get into this situation where we are talking about a true repair, like a DER approve repair. There is a whole other set of issues that come into this about who has the design authority to approve the repair and that kind of stuff. That takes significant effective communication between all the parties involved.

We are aware of a number of conditions where some of the technology involved in those repairs can be considered to be competition sensitive, or stuff like that. One of the things we might work on in some of our committees is where to draw that fine line. What is considered normal wear and tear, normal maintenance and minor repairs, and what is in fact a value added repair that allows everybody to be successful.

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GANDON/THALES – Thales repair Stations are operating with the same rules as would any Airline or MRO operate. All repair stations have a FAR/EASA Part 145, and have to guarantee their certification on a regular basis. Embodiment of a modification without certified documentation is a breach of these regulations.

There is an additional safeguard through the Technical Support Department. This department is in charge of defining the technical publication released to introduce a modification. All relevant Thales Technical Publications are available through our Internet portal called "Customer OnLine."

SCHULTZ/HONEYWELL – There is actually two questions in here. The first is disclosure. We will discuss that in-depth in response to Discussion Item 12-040: how, when, and why these procedures will be disclosed.

However, that conversation notwithstanding, Honeywell agrees that performance of undisclosed procedures is in violation of FAR guidance, and puts both MRO and operators at regulatory risk. All parties must remain vigilant to ensure that existing processes are adequately robust, to assure that only approved work is performed, and that these processes are followed diligently. Editorially, there are some things, FedEx that you are going to beat us up later where we have had technicians perform work at risk that was not approved. That was caught by our quality process. They have not been released to the operator; however, we are now in the uncomfortable position where we have done work on your part that you did not approve us to do, and we have to get a retroactive approval from you before we can release those parts. It is something that is against our process, we are working with our technicians on training.

So, to state in support of this acknowledged risk, standard Honeywell policy is as follows:

> Upon receipt, technicians review repair requests and blanket operator policy statements to ID approved maintenance procedures. During the quote process, all planned maintenance activities will be disclosed to the operator. If any operator has questions regarding the work to be performed or their own review and approval status of these repairs, they are asked to immediately contact Honeywell via their onsite technical focal, FSC, or the TOC. Finally, only operator approved modifications will be performed and returned to the operator.

If you have any questions, please see me, Karl Schultz over here at the table at break.

LAGRANGE/ROCKWELL COLLINS – Rockwell Collins reviews incoming repair orders for operator instructions. Common instructions include using the current CMM or a document specifically approved by the operator. When a unit arrives without instructions, our administrators are instructed to seek guidance from the operator. Rockwell Collins has recently completed a review of all repair documentation and found some isolated instances of repairs being conducted with manufacturing documentation. This documentation has been incorporated into our CMMs for future use.

JAMES/BRITISH AIRWAYS – I would just like to reference Discussion Item 104 in response to what Thales has just said. Question 104 relates to a CMM requirement for VDL Mode 2 testing of the EVR 750 VHF radio. I have a written response from a Thales engineer, and I have it with me. It states, they do not use the testing procedure described in the CMM. When I questioned what Thales was doing in their shop. So going on from what Thales has just said, I got some conflicting data.

MODERATOR – Thales, would you like to respond to that?

GANDON/THALES – Maybe—I can answer question 104 now?

MODERATOR – I think we will wait until later for 104. I'm asking, If you want to respond British Airways statement directly.

GANDON/THALES –I will defer, so I can talk to Peter, and when I answer question 104 to clear this up.

MODERATOR – That is fine. Thank you. Thales has requested to make some comments in regards to question 11-001 and 104.

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GANDON/THALES – I just wanted to say that we had lunch together with British Airways, and we have been through the specifics of Item 104. I will address British Airways email when I address question 104.

Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
4	**Piece Parts**			**All**		**AMC Steering**	

The AMC Steering Group understands the AMC is a technical forum, but commercial issues are becoming a larger part of effectively managing the life cycles of components.

The AMC Steering Group would like to ask the airframers if there are provisions in their Product Support Agreements to control piece part cost escalations. If not, would this issue be a consideration for future revisions to the PSAs to protect the operators from escalations greater than the Industry accepted escalation indexes?

Airframers, comment please.

KIMBALL/BOEING – The short answer to the question is *yes*. Boeing does have controls in our product support assurance agreements for price escalation. Boeing has people that look at those and monitor that. Then, of course, we work with any customer that has a particular issue. As with everything else, there is a variety of different contracts depending on the generation of the airplane and the particular part involved. So, we are more than willing to work with our customers to look at that. The answer is, of course, we do have them.

GLAPA/AIRBUS – The Airbus Support Contract includes an escalation formula for the annual price revision. The formula is based on the U.S. material and labor indexes and is reviewed with the suppliers. The escalation formula applies to all items that are supplied by the suppliers under the contract. Indeed the Support Contract is available for our customers as part of the technical data deliverables. Our customers can also review the contract online through the Airbusworld Application.

JAMES/BRITISH AIRWAYS – There is another aspect to this question. It is not only about price escalation. It is about units that we are sending for repair where the repair is being carried out and not actually documented in the maintenance data. They will not give us access to that maintenance data they are actually using.

JOZIC/KLM – There is one more aspect to the issue about price escalation. It is that some OEMs do price escalation for the whole package. Then they are evading the Boeing and Airbus window. However, the most used parts they price them much higher than the window.

FERREIRA/TAP AIR PORTUGAL – We support this issue, and in fact, we have observed in some occasions price escalations of up to 60%. I would like to ask if there is any exception to this escalation formula for when an item runs into obsolescence and a new part is needed. Is there a cap to the escalation formula?

KIMBALL/BOEING – As I understand it, the way it is structured today, a new part number, whether it is a brand new part or a replacement for an obsolete part, starts over again. But we should probably take an action item to go back and check how that works.

MATTHEWS/AIRBUS – I would concur with Boeing that the escalation is on the parts going from one year to the next, and the obsolescence solutions would be looked at on a case by case basis. Obviously looking at the cost of the solution and showing that it is aligned to the requirements.

DEVLIN/AMERICAN AIRLINES – We obviously support this item. American Airlines understands that through inflation labor and materials do increase every year and some cost escalations are unavoidable. However, when there are situation with egregious price increases, the airlines do take notice of that. It creates more of an adversarial relationship between the airlines and the suppliers, which is not healthy for our industry. We do want our component suppliers to be profitable. It is good for the industry, but it is something that we need to keep in check. Just to make the point, airlines do notice and take note when the situation gets out of hand.

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Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
5	PMA Parts/Obsolescence	Misc	Misc	All	All	FDX	

Obsolescence issues are becoming more and more a fact of life as we utilize aircraft later into their life-cycles. For various reasons, when OEMs declare a piece part or sub-assy obsolete, it can be very costly to re-qualify a new replacement part for that application. For cases where the OEM has the original specification data for that part and its unique application, we would like to see that data shared with the operators so we can research and pursue an existing replacement part or work with the PMA Houses to develop a replacement solution as a new PMAed part. This strategy could alleviate the burden placed on the OEMs for dealing with some obsolescence issues and make it more effective for the operators for a long-term solution.

Other operator, supplier, and airframer comments, please.

GUILLEMIN/AIR FRANCE – Air France supports this issue.

KOZACEK/DELTA – We support this very much. We think there is a considerable amount of savings. Also, I think it keeps our other suppliers on their toes, so we certainly appreciate this support.

KLINK/FEDEX – I guess just to give you a little more background on how this item came about is that we have had a couple of cases where a piece part on a circuit card went obsolete and for various reasons it required a complete redesign of that circuit card or the subassembly. It turned into quite an expensive venture. That is kind of where this is leading to. We are hoping to get some advance notice and coordination at the piece part level before we have to go into drastic forms of whole subassembly redesign.

HARTLEY/MONARCH – We support this proposal by FedEx. Monarch has suffered from very high costs of replacement parts due to obsolescence. I would be very interested to hear the OEMs' feedback.

JOZIC/KLM – We certainly support FedEx on this issue. Our experience is also if an OEM declares a piece part obsolete, you have to replace the whole box and retrofit, sometimes, the whole fleet.

What we would like to do is if they declare something obsolete, they should release the specification of that part and then we will solve obsolescence issue within KLM.

PIERCE/AMERICAN AIRLINES – We also support this. As everybody knows, once something becomes obsolete, it takes a long time to design a replacement. It is not something you do instantly, depending on how many spares you have it can really put the airlines in jeopardy. Too often, we are not notified ahead of time that something is going to go obsolete and so getting that notification is important. And working with somebody, a lot of times this is aircraft that is no longer in production. The parts are not either, and so it can help everybody to have PMA opportunity options for that.

SANTIAGO/UNITED AIRLINES – We agree with that and we support FedEx. We also agree with KLM's statement about getting the specifications when the part goes obsolete.

GATES/AMERICAN AIRLINES – One unacceptable option for obsolescence is a very expensive retrofit service bulletin. For instance, we are experiencing some of the parts on our aircraft SIU and things you can not acquire anymore. The only fix is an expensive retrofit to the aircraft.

GLAPA/AIRBUS – Airbus requires the suppliers to implement an obsolescence management program that demonstrates the suppliers' life cycle management of the components and their replacement. We have seen success with some suppliers and less with others. Without going into the details of being victims of the global market and component consumption, our previous studies concluded that it is absolutely necessary for the

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suppliers to plan the life of the components in terms of reliability, of availability and to plan replacements at a reasonable cost and with an acceptable life span.

Airbus proposes the following approach.

- Obtain factual understanding of the obsolesce cases.
- Agree on an industry forecast methodology, timing, and implementation.
- Review options for the industry when considering that the obsolescence problem will significantly worsen in the medium term, due to the supply chain of components being governed by high technology consumption activities.
- Review of the throw away culture could be envisioned for avionic LRUs.
- Work with other industries confronted by the same kinds of issues and benefit from their component supply chain model.

Airbus sees the benefit of working the obsolescence collectively, where the sharing of the component specifications could be an option. This was reviewed in the AMC Obsolescence Working Group, where we concluded that the costs of establishing the capabilities were prohibitive. Perhaps the option needs to be revisited.

KIMBALL/BOEING – I have this mad urge to invoke Bill Roman's speech from 20 years ago. It's his "component obsolescence is going to drive you crazy" speech. But I will not. We talk about this every year. There is a variety of different mechanisms in place. Our product support agreements, very similar to what Airbus mentioned, place requirements on the suppliers to notify both ourselves and the customers of the impending obsolescence, but as we all know, sometimes those component obsolescence are planned events and our supply base that they are reluctant to tell us about, particularly when you base your designs on consumer electronics components which many of us have a lot of experience with have very short lives.

So, from our point of view the only real way to handle something like this is on a case by case basis, and it requires good communication. It requires the suppliers to notify both ourselves and the customers when they are aware of these things so that we can in fact work as an industry to resolve what the best approach to this particular situation is. Every situation has somewhat unique characteristics and usually has a different solution. Managing obsolescence is very much like a triage operation. You try to handle it at the lowest possible level, and if you can not handle it there, you have to start moving up the chain. As somebody mentioned, if you are back to a certification program for an airplane. That can cost a lot of money, let alone the retrofit changing all your displays.

The bottom line again is that our product support agreements do have requirements in there for obsolescence notice. They also have, as was mentioned in this question, controls in there over price escalations, as we talked about a little while ago, but the only real solution to this thing is management, because you are never going to be able to eliminate obsolescence, and early notification and coordination of all the three parties involved is usually the best way to do it. In some instances the specifications are available. In some instances there are other organizations that would be willing to take the product line. There was somebody here a few years ago that said that their goal was to be on the leading edge of the trailing edge of technology, which I thought was a very good line. So there are resources available, but it takes coordination and some shared pain because no one wants to shovel the effort all by themselves.

KOZACEK /DELTA – Just one thing that I think would help us all out is that when something does become obsolete, if both Boeing and Airbus would step up and make a requirement out there that the OEMs that build those components aren't going to produce them anymore to make those specifications available for the rest of us, so we could go out and shop for our own PMA if necessary.

DEVLIN/AMERICAN AIRLINES – I would like to echo Jeff's comment on the communication aspect. I understand how challenging it could be to manage the supply chain on electronics. We the operators just ask that the OEMs be upfront with us and communicate with us what the challenges are going forward. As Mike from American pointed out earlier, the PMA development path is a very long timeline. So the sooner we can be notified, it puts the operation at less risk.

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HUBBARD/ROCKWELL COLLINS – Rockwell Collins agrees obsolescence is a significant and costly industry issue. We make every attempt to minimize the impact of obsolescence by searching all possible sources for drop in replacement parts, making lifetime purchases, and redesigning subassemblies. In a few cases, we have provided technical documentation to third parties and operators for continued support of outdated technology. Rockwell Collins is willing to discuss this practice with operators on a case by case basis.

Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
6	**CMMs for PMA Parts**	**Misc**	**Misc**	**Misc**	**All**	**FDX**	

FedEx would like to put forth a better understanding of the confusion surrounding the use of OEM CMMs for PMAed (Test & Computation) parts. When the operators obtain the Intellectual Property rights to use an OEM's CMM via the Airframer's Product Support Agreements, the operators then become obligated to use that CMM only for test and repair of the OEM P/Ns listed on the title page of the CMM.

However, there are statements on PMA paperwork signed by the FAA that basically state there is no technical requirement for the PMA holder to develop separate CMMs when the original part and the PMAed part are no different. FAA Special Airworthiness Information Bulletin NE-08-40, dated 08AUG08, also discusses this subject. We feel the legal compliance associated with the OEM CMM obligates us to use that CMM for the OEM parts only - even though the FAA states there is no technical requirement for a separate PMA CMM. We're putting the PMA Houses on notice that for us to consider their PMAed parts, they must come to us with their own CMM.

Other operator, supplier, and airframer comments, please.

HUNTER/HEICO – This is my first time here, but it will be very brief. Regarding CMM or ICA for PMA parts: The PMA providers are required to make an assessment on the ICA when they make application to the FAA. That assessment is either the existing ICA applies or if it does not they would have to submit supplemental ICA. Actually, Heico and the FAA strongly disagree with this position, and I will read the FAA's words here. It says the documentation burden on maintainers and owner operators in maintaining their products is minimized when existing ICA is utilized to the maximum extent possible. A design approval holder may not prohibit the application of its ICA to subsequent design approvals if the FAA has determined that the existing ICA is acceptable. So, the system is the safest and the easiest with essentially one set of books. So, I hope for the operators, and that is really the practice, that is the way it is been all along.

MODERATOR – Did you have a policy number for that FAA statement?

HUNTER/HEICO – It is 8110-54A.

KIMBALL/BOEING – There are a couple of layers to this problem, as we are all aware. One of the things I want to make sure that everybody understands is that when it comes to component maintenance manuals, they are not ICA. You can go back to the same 8110-54 that was just quoted, and it very clearly states that ICA is required only for products that have a type certificate, which is engines, aircraft or airframes, and propellers. The ICA ends at the remove and replace activity. So your components, with the notable exception of some things like SFAR88 fuel pumps, those CMMs are not considered ICA and they are outside of those requirements.

But given that, there is also quite a bit of confusion about whether or not what kind of PMA we are talking about, because there are two types of PMAs out there. This particular issue as input by FedEx talks about the test and computation of what we also talk about as aftermarket PMA parts. So we always have to be clear as to which ones we are talking about. The reality is that most U.S.-based original equivalent manufacturers, most of the Boeing supply base, they have PMA for their parts also. And they have a license agreement with the type certificate holder that allows them to sell those parts into the aftermarket with FAA approval. The Test and Computation PMA parts, of course, are done without the type design approval holder's knowledge and responsibility.

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We think in this item, FedEx is addressing the use of the OEM's intellectual property to support parts that are not covered by the OEM's engineering or quality systems but for which the FAA has issued a PMA asserting that it is equivalent. For the sake of this discussion, I will refer to these things as the Test and Computation PMA replacement parts.

There is another level of distinction that must be made clear. In many cases, the only OEM license PMA for the article that is installed on the airplane is governed by the type certificate. It includes all of the detailed parts of that assembly. The Test and Computation PMA parts for the non-OEM replacement part typically are detail parts that the FAA has determined that the part is equivalent or identical to the original part and that it is acceptable to use as a direct replacement for the original part. In many of those cases, even the CMM, even though it is not ICA, is not impacted because it is a part substitution, it is a bracket or a bolt or whatever it is, a flange, that happens to be a direct replacement. It does not by itself need additional maintenance information or turbine blade. The real issue I think comes up when you have a PMAed repairable assembly. Such as a pump or a motor or something like that that in fact has maintenance requirements against that level of documentation. When an airline such as FedEx receives the airplane from the Boeing Company and our supply base, they have signed a license that stipulates that the data provided is limited to the use of the maintenance on that part number that is on the cover of the thing.

When you PMA an aftermarket part you have got to put a different part number on it. So by definition, that CMM no longer applies, because it has the wrong part number on it. And if you use it to repair that other part, you are in violation of the terms of your intellectual property agreements. So that is I think where we get into much of this confusion, because if you can use the PMA part just like in the old days where we allowed every airline in the world to go buy a capacitor, if it was a Sprague whatever it was, they did not care who you got it from, it was a direct part substitution, didn't require any change to the documentation at the higher level. And for a PMA parts for piece parts that still works pretty good, but where you start getting into trouble is where you get a repairable assembly that you have maintenance data that is required for it, then you can run into trouble because you have violated the intellectual property agreement under which you obtained that CMM for in the first place.

<u>HUNTER/HEICO</u> – I am sorry to disagree with Boeing, but that is not exactly accurate on the CMMs. We are going to talk a lot about this afternoon in the symposium, but it clearly states again that if the CMM is referenced as the appropriate location in the ICA, and there are hundreds, if not thousands, of CMMs referenced, you can do the path. In fact, we walked a number of our customers right through it. So in the AMM it calls out the CMM and it points you to the exact number and location where to go for many many, not all of them, it is true, but most of them. It is incorporated by reference. Under the rules and regulations it says those applicable instructions are incorporated by reference and become part of the complete set. So when the owner buys the aircraft, he really gets all the data without restrictions. Furthermore, in terms of using the manual for repairing a PMA part, as they said, that is also in conflict with the regulations because the part number in the supplement is listed as a direct replacement. So, anything you can do to the OEM part, unless otherwise specified, you can do it to the PMA part.

Again, these rules are there for safety. So, not only is the CMM allowed to be used (or the ICA depending on how it is flowed down), it is supposed to be used for maintaining the PMA part. The FAA is really crystal clear on this. In fact, if anyone wants to take it on further, we can do it. But we are going to talk about it this afternoon.

<u>MODERATOR</u> – I assume Boeing has a rebuttal.

<u>KIMBALL/BOEING</u> – Actually it was more of an advertisement to come to this afternoon's seminar on ICA and Intellectual Property. But there are some very specific terms, and the FAA is very clear on it. We talk to them every day about this, and ICA, when it applies to CMMs, is under the discretion of exactly how we have referenced that information in the illustrated parts catalogue or in the ICA data, and just a standard reference, it says that this part has that CMM does not make that CMM ICA. You have to call on a specific activity in the aircraft ICA that was approved by the FAA that requires the use of the CMM for that activity. So, we have 22,000 CMMs in our system and only about FAR 124 or 125 of them are ICA.

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GLAPA/AIRBUS – Indeed, this is a very interesting question. I will presume it covers the concert of continued supply of parts through the PMA part suppliers as opposed to the cost of supply of the original part. Airbus would be interested in understanding the mechanism for the PMA parts suppliers to issue a CMM under their own intellectual property and house repair stations would refer to this CMM for the official documentation linked to the concerned repaired item.

However, Airbus recommends that this important subject is fully addressed in the framework of the ARINC Project Paper 674 as presented by Marijan from KLM this morning.

FINKENBERGER/DIEHL AEROSPACE – Diehl also considers this a very important item, and we are looking to that from an avionics supplier perspective at the few cases of subassemblies for instance that could be subject to PMAs. In this regard we fully support the FedEx initiative because we consider this a basically fair and reasonable approach for both the airlines and the OEMs. It should be such a commercial requirement but I agree with Airbus that this needs to be discussed and we should clarify the thing there. Because there are various different stories around that and Boeing has brought up a few of them. Nevertheless, in order to avoid all the mentioned problems, Diehl Aerospace strongly recommends the use of original OEM parts, and in this case the customer can rely that the parts ordered fully fulfilled the technical specification and form, fit, and function to all aspects.

> WRITTEN/DIEHL - Diehl Aerospace fully supports the FedEx initiative. This is basically a fair and reasonable approach for both the airlines and the OEMs. It should be a general requirement to PMA Houses to provide a full set of documentation for their PMA parts.
>
> However, in order to avoid the mentioned problems Diehl Aerospace strongly recommends using the original OEM parts. In this case the customer can rely that the parts ordered fully fulfill the technical specification in form, fit and function to all aspects.

KLINK/FEDEX – I would like Boeing to see if they can comment on this question. This is the recent policy clarification letter by the FAA, PS-AIR-21.50-01, that will be a part of the symposium later this afternoon. But on page 3, it says: "*Therefore it is not acceptable for a DAH to limit the distribution of ICA through restrictive access or use agreements, or by adding restrictive language that would control the use ICA by an owner/operator with respect to the maintenance of this product.*"

I understand even though the licensing agreements and the titles to CMMs are more restrictive than what the FAA says, so that means we have to abide by contracts that we have signed, but I am wondering if Boeing is going to reconsider having that as part of our purchase agreement for the airplanes and maybe change their position or are you going to say that since CMMs are not ICAs then this statement does not apply.

KIMBALL/BOEING – I happen to have a copy of that document that you are talking about the issue is as we understand it, and if you read the comments, the official Boeing comment that was made to that AIR, Boeing supports this statement. We ensure that the entitled operator, who is the only one that is required to comply, has access to that information. Nobody else is required to comply.

KRAMER/US AIRWAYS – I have read the FAA Order 54A. From my perspective it is pretty clear that as Boeing mentioned that CMMs are not considered ICA, and in fact, it pretty much says that typically CMMs are not considered ICA; however, if the CMM is referred in the AMM, it is considered ICA. The examples that Boeing gave with SFAR 88, those are the very few, because I think the SFAR 88 items are actually included in the CMR documents and the AWLs. I think there has been a lot of confusion between ICA and CMM from the operator's perspective, we should consider CMMs as non-ICA.

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Item	LRU Name	LRU PN	Vendor	Aircraft	ATA	From	If MRO, the Associate Airline
7	**PMAed Parts in LRUs**	**Misc**	**All**	**Misc**		**FDX**	

We would like to open dialog with the OEMs so we both better understand the maintenance practices surrounding PMAed or DER repaired parts installed in LRUs. We are aware of instances where an LRU that has a PMAed or DER repaired part installed is sent to the OEM for test/repair, and that PMAed or DER repaired part is removed from the LRU even though it is not failed. The OEM states that since they do not recognize the configuration of the PMA or DER repaired part, they have the authority to remove and replace it with the OEM authorized part.

As long as the operator has published engineering documentation that approves the installation of the PMAed part or documents the approval of the DER repair that is operator specific as part of the Operator's Instructions for Continued Airworthiness for that LRU, any Part 145 repair station that we select to test/repair that LRU must follow the operator's documented maintenance instructions. These same rules apply for an OEM that has a Part 145 repair station the same as it applies to a 3rd party repair station. We would like to hear a commitment from the OEMs to stop this wasteful practice and follow the FAR rules for the Operator's Continued Airworthiness Maintenance Program.

Other operator, supplier, and airframer comments, please.

Estimated Annual Cost Penalty: $250,000

DUQUESNE/AIR FRANCE – Air France also supports this issue. The owner of the line replacement unit remains the airline. The OEM must follow the instructions from the operator and only repair the failure.

JOZIC/KLM – We also have experience this situation, if you send the LRU for repair to the OEM, they remove the PMA part. The OEM then install their own part repaired unit and send us the bill for everything.

KLM has always been puzzled as to why the OEM is doing this, if the PMA part is good for the FAA, why shouldn't it be good for the OEM. I do not understand why they should remove a perfectly good working part and install their own part and send the bill.

HARTLEY/MONARCH – We just spent a lot of money on a DER repair on a major LRU on a single aisle aircraft. We would be very unhappy if we sent it to the OEM and they remove that part, even though it has been authorized by the FAA as a repair scheme. We would just like any OEM comments, please.

KOZACEK/DELTA – We as well have some parts out that had PMA parts. We require them to repair per our maintenance program. One of the things that is a thoroughly common comment is that they will send it back to us, but they will not certify the part. If it is a part of our maintenance plan and it is in our CMM, we believe that they are required to certify that if they are a FAR 145 repair station.

FERREIRA/TAP AIR PORTUGAL – We strongly support this issue.

SANTIAGO/UNITED AIRLINES – We support this issue also. We have seen some of the same things.

PIERCE/AMERICAN – We also support this. In the case of maintenance, OEM is an MRO. They are no different; they do not have any special dispensation. As long as it is in the maintenance program that we have specified, they should recognize it and they are authorized to repair it per that program.

SCHMIDT/LUFTHANSA TECHNIK – We also support this question because we have similar experiences in the past that the OEMs then remove the full PMA and say that it does not comply with their internal quality issues.

THOMAS/BRITISH AIRWAYS – We also support this issue. We have also experienced similar issues.

STUMMER/AUSTRIAN AIRLINES – We also support this.

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GLAPA/AIRBUS – The operator's service or work orders should clearly define the maintenance actions and reference the instructions that have to be followed when repairing and testing the unit. Any proposed changes to the work order instructions should be approved by the customer. The operator should provide all necessary information on the approval of the PMA part in order to ensure that the suppliers are aware and able to perform the work as required.

KNOEDLER/DIEHL AEROSPACE – It is Diehl Aerospace's philosophy to inform our customers in case of installed PMAed parts inside their equipment originally manufactured by Diehl Aerospace. Our customers do have the possibility to select between two alternatives scenarios:

First, our customers can request their equipment back as it is with an invoice for the inspection costs. Or second, our customers can accept to get the PMAed parts replaced with OEM parts. A repair invoice and OEM approval certificate will be provided with the equipment.

However, Diehl Aerospace cannot accept third party engineering documentation as basis for the equipment release process, using an authorized certificate like 8130-3 or EASA Form 1. In so far, a third option would be to get the equipment back repaired, but red tagged without certificate.

KIMBALL/BOEING – You have heard me say this before. I think the challenge is that this is one of these many threads that has wandered through the discussions over the last couple years. It is evidence of the rising bar of compliance in the intellectual property wars. Contrary to what was just said, if the OEM is in fact operating a repair station, they are bound by regulation to utilize the airline's approved maintenance documentation. If the airline's approved maintenance documentation includes a PMA part, then a repair station has the responsibility to return that to the airlines approved configuration per their documents.

The challenge may be that inadequate information has been supplied to the repair station to allow them to verify the approval status of either the replacement part or the DER approved repair. Then you might be in the same situation again that whoever the DER was that approved the repair might be trying to protect his intellectual property and not want you to send it to anybody else. I think it is truly evidence of the situation we are in in the industry. But the repair stations have the responsibility to work to the airline approved data. If the airline has approved this part, the repair station has an obligation under regulations to return it to that airline in the airline approved configuration.

KLINK/FEDEX – I appreciate the comments by Diehl. They are very upfront about their company policy, and basically what I heard was they feel that they can not certify a part that has a PMA subassembly installed. Essentially they have put the operators on notice that we are going to have to seek alternate repair source for those specific parts. It is good to know that policy.

I was disappointed that we did not hear from some of the other suppliers, because I know there are some varying degrees in this policy but I think Boeing pretty much summarized it. So, I guess we just need to make sure that the operators are put on notice that if they do come across such a policy as stated by Diehl, you need to be prepared to send your work to an alternate MRO.

PIERCE/AMERICAN AIRLINES – I am not aware of any regulation that says an operator has to substantiate their maintenance program to an MRO. Regulation says the MRO must follow the operator's maintenance manual. When they do maintenance for an operator they are saying they followed that manual, so that is what they are certifying.

DUQUESNE/AIR FRANCE – To recertify is to release the work done, not the other work, and not the previous work. In fact, there are already certificates for the work down by the repair station.