Airlines for America™

We Connect the World

CIP IND 2018-03 (V1, 2)
“Other Structure” procedure update
Overview

Jan Huelsmann
May 2023

CIP IND 2018-03 (V1, 2)
“Other Structure” procedure update

Issue:
Inspection requirements for most of the structure items categorized as Other Structure can be satisfied by the Zonal program.

Problem:
Current procedure written in the structure section analysis of Other Structure is not up-to-date and not in compliance with the existing methodology in Structures and Zonal programs. It does not reflect the capability of the SWG to recommend applicable and effective tasks for “Other Structure”.

Proposal:
Revise the the related MSG-3 Procedure paragraph to clarify that Other Structure is generally satisfied by the zonal tasks resulting from the zonal analysis procedure but the SWG can determine additional maintenance where deemed necessary.

Airlines for America™

We Connect the World

CIP IND 2018-04 (V1, 2)
SSI Selection and Analysis Organization Guideline

Update overview

Hamid Nouri & Jan Huelsmann
May 2023

CIP IND 2018-04 (V1, 2)
Log of changes

Rev. 00

•2019 IMRBPB MEETING: OTTAWA, CANADA

- Recommendation list to be completed
- “Analysis” to be addressed vs. “Task”
- Used “bulleted list” vs. “text” to define recommendations. It should have been kept as guidelines not solid list
- “Highest manageable level” idea offered by the CIP for SSIs supported by the IMRBPB, further work required

Rev. 01

•2021 IMRBPB VIRTUAL MEETING

- Rev. 00 Comments incorporated
- CIP divided into:
  Part A: Boundary determination (not included in MSG-3)
  Part B: Selection (based on the idea of highest manageable level and having steps to follow same way as MSI selection.
- Feedbacks collected

Rev. 02

•2022 IMRBPB VIRTUAL MEETING

- In order to collect the reviews in an efficient way, multiple virtual follow up meetings has been conducted
- EASA, DGAC and TCCA contributed to improve the CIP since August 2021
- CIP circulated in MPIG and RMPIG and comments incorporated

Rev. 03

•2023 IMRBPB MEETING

- Part A: CIP updated as per IMRBPB 2022 minutes of meeting
- Part B: CIC application consideration added

CIP IND 2018-04 (V1, 2)
Rev. 03

2022 IMRBPB VIRTUAL MEETING
Main comments:

- Logic diagram to be aligned with those currently shown in MSG3 (TCCA)
- SSI List is reviewed / finalized by the WG, and approved by ISC (EASA)
- The keyword should be SSI ”selection” instead of “categorization” (EASA)

- During IMRBPB CIP review EASA agreed to revise the CIP with EASA Structure Specialist
- 4 Meetings held with STR MPIG members and EASA Structure Specialist

CIP IND 2018-04 (V1, 2)
Improvements

Rev. 03 MAJOR UPDATES

- Problem section updated to include IP 192 requirements explanation and SSI requirements digital electronic logic flowchart revised to inline with standard logic diagram .
- Part A, revised guidelines for SSI selection:
    - Explanation updates to reflect IP 192 inclusion
    - SSI/Other Structure concept of **Categorization** replaced by **Selection**
    - The standard / traditional logic diagram used, instead of digital electronic logic tree, to align with those currently shown in MSG- 3 document. Figures 2-4-4.1 and 2-4-4.2 updated to reflect the first and second bullet point above.
- Part B, general guidance for organizing the analyses of SSIs
    - CIC application and effects on SSI analysis organization added

Airlines for America™

We Connect the World

MPIG CIP-IND 2022-01

Fault-tolerant system definition

May 08th 2023

Background of the issue

>> IP 112 Fault-tolerant systems guidance introduction

- Clarification on the proper consideration of functional failure statements of fault-tolerant systems added important guidance to the systems MSG-3 document.

- However, the text introduced in the glossary is incorrect as it implies that a fault-tolerant system is a system that *'by design the aircraft may be operated indefinitely with the fault(s) while still satisfying all certification and airworthiness requirements.'*

- There is no relationship between the time in which the aircraft can be operated, it's ability to satisfy certification requirements and the fault-tolerance definition. Such definition may create incorrect interpretation and application of the MSG-3 methodology.
    - The system fault-tolerance characteristics depends not only on its architecture, but also on the function being analyzed.

- MPIG proposes a new glossary entry and evaluate the usage of the term within the MSG-3 document;

MPIG Proposal

Glossary entry (applies to Vol 1 and Vol 2)	
Fault-Toleran~~t~~ce ~~System~~	When the design of systems or functions contain ~~A system or function that is designed with~~ redundant elements ~~that can fail without impact on safety or operating capability. Redundant elements of the system may fail (fault), but the system itself has not failed. Individually, and in some combinations, these faults may not be annunciated to the operating crew, but by design the aircraft may be operated indefinitely with the fault(s) while still satisfying all certification and airworthiness requirements.~~ such that a failure of one (single-fault tolerant) or more (multiple-fault tolerant) elements would still allow its function to be provided to the aircraft uninterrupted.

Airlines for America™

We Connect the World

CIP_IND-2023-01

Use of image capture devices for GVI tasks

Prepared by: Lorenz WENK / Oliver WEISS from Airbus

February 2023

Background
The benefit

The use of remote power controlled video and image capture devices (i.e. drones) and handheld mechanically extended video and image capture devices (i.e. rod mounted small cameras, phones, etc.) by manufacturers, operators, MROs and engineer/technicians has become prevalent in the industry. With many airlines and charter fleets operating multiple aircraft types by different manufacturers, the use of these devices to perform General Visual Inspection for scheduled and unscheduled maintenance has become routine. The ease of using these devices to perform GVI task especially after lightning strike and the resulting economics savings has spurred operators to insist manufacturers now include this type of inspection procedural method in their maintenance manuals.

The advantages related to use of such technology are significant pertaining to:

- reduction in accidental damage
- reduction in risk to humans related to fall exposure
- reduction in out of service time for maintenance
- reduction in maintenance cost
- capture of visual historical data

Technology enables various methods of visual detection which can produce an equivalent or higher level of detection compared to a certified individual's human capabilities for GVI task.

Background
Back to 2017

In that account, MPIG updated the publication of the MAP 2017-02 “AMM instruction Requirements for Remote Visual Inspection” in 2019 to create a term and definition in A4A Common Support Data Dictionary (CSDD) that can be used across the industry to refer to this method of GVI accomplishment.

quote

General Visual Inspection Performed Remotely (GVR)

General Visual Inspection Performed Remotely (GVR) is an inspection method using peripheral devices (drones, robots, scanners, cameras, etc.) which will emulate or exceed the current MSG-3 GVI glossary definition.

unqote

Background
MSG-3 Task definition

Inspection - Detailed (DET)	An intensive examination of a specific item, installation or assembly to detect damage, failure or irregularity. This could include tactile assessment in which a component or assembly can be checked for tightness/security. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors and magnifying lenses may be necessary. Surface cleaning and elaborate access procedures may be required.	…intensive examination … …specific item, installation or assembly to detect damage, failure or irregularity.
Inspection - General Visual (GVI)	A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to enhance visual access to all exposed surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight or drop-light and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked. Basic cleaning may be required to ensure appropriate visibility.	…visual examination … … interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity.
Inspection - Special Detailed (SDI)	An examination of a specific item, installation, or assembly making use of specialized inspection techniques such as Nondestructive Testing (NDT) and/or equipment (e.g. boroscope, videoscope, tap test) to detect damage, failure or irregularity. Intricate cleaning and substantial access or disassembly procedures may be required. Classification of a task as an SDI does not define the required qualifications for the person performing the task.	… examination of a specific item, installation or assembly… … to detect obvious damage, failure or irregularity.

Considerations
Drone capabilities

As currently available inspection aids (cameras, lightning etc.) installed on a drone are capable to detect obvious damages on external aircraft surfaces, it can be demonstrated that a inspection carried out by a drone fulfils the intent of a “classic” GVI.

Inspection - General Visual (GVI)

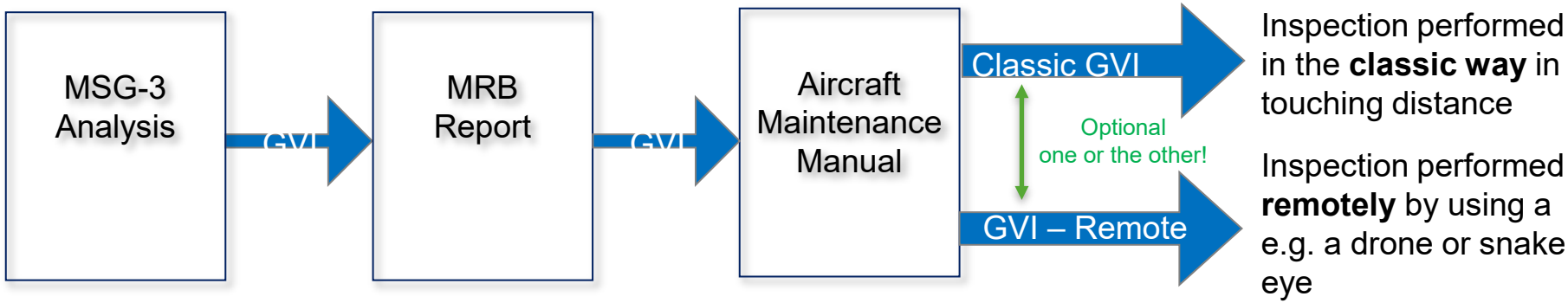
A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to enhance visual access to all exposed surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight or drop-light and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked. Basic cleaning may be required to ensure appropriate visibility.

Considerations

Just optional

The use of a drone to perform a GVI has to be offered as an alternate means to the classic GVI task.

The alternate means, use of e.g drone, has to be provided on the level of the procedural document (e.g. AMM) and not on the level of the MSG-3 analyses and/or MRB Report.



Conclusion

Impact on MSG-3 / IMPS

Based on the consideration that a GVI performed remotely fulfills the initial GVI task intent, the impact on the MSG-3 methodology (document) would be limited to indicate that the General Visual Inspection Performed Remotely (GVR) is a supplement to the already existing GVI.

The following definition is proposed to be added to the MSG-3 glossary:

Inspection - General Visual (GVI) - Performed Remotely (GVR)	A General Visual inspection performed Remotely (GVR) is an inspection method using peripheral devices (drones, robots, scanners, cameras, etc.) which will emulate or exceed the current MSG-3 GVI glossary definition.

Open Questions

Do we have to limit the use of drones to ZIP GVIs?

Airlines for America™

We Connect the World

CIP MPIG 2023-02

Level 3 Analysis – AHM Effectiveness Determination

May 8, 2023

Issue

Following the selection of an AHM Hybrid in a Level 3 analysis, it may be possible that the result provides no evident benefit compared to the classic task.

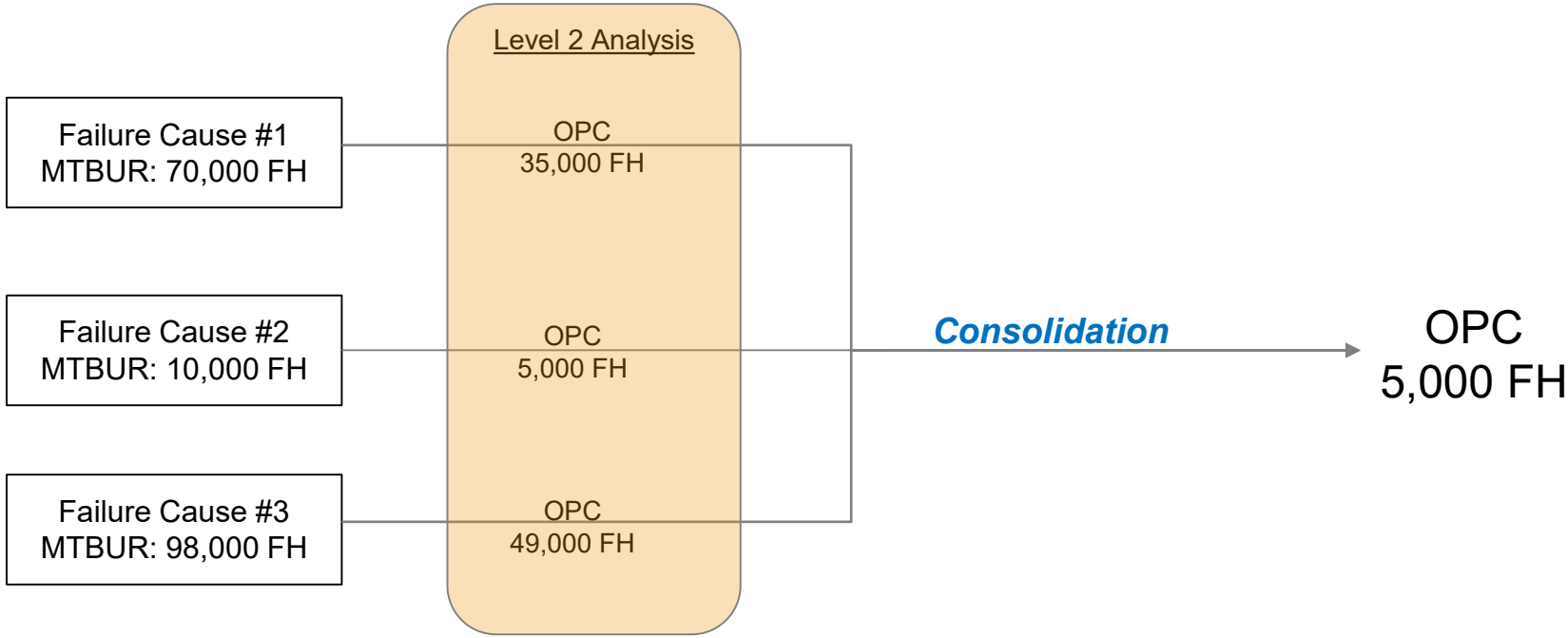
The logic flow needs to be updated to create the possibility of not selecting an AHM Alternative/Hybrid if such selection would not lead to an effective outcome.

Problem

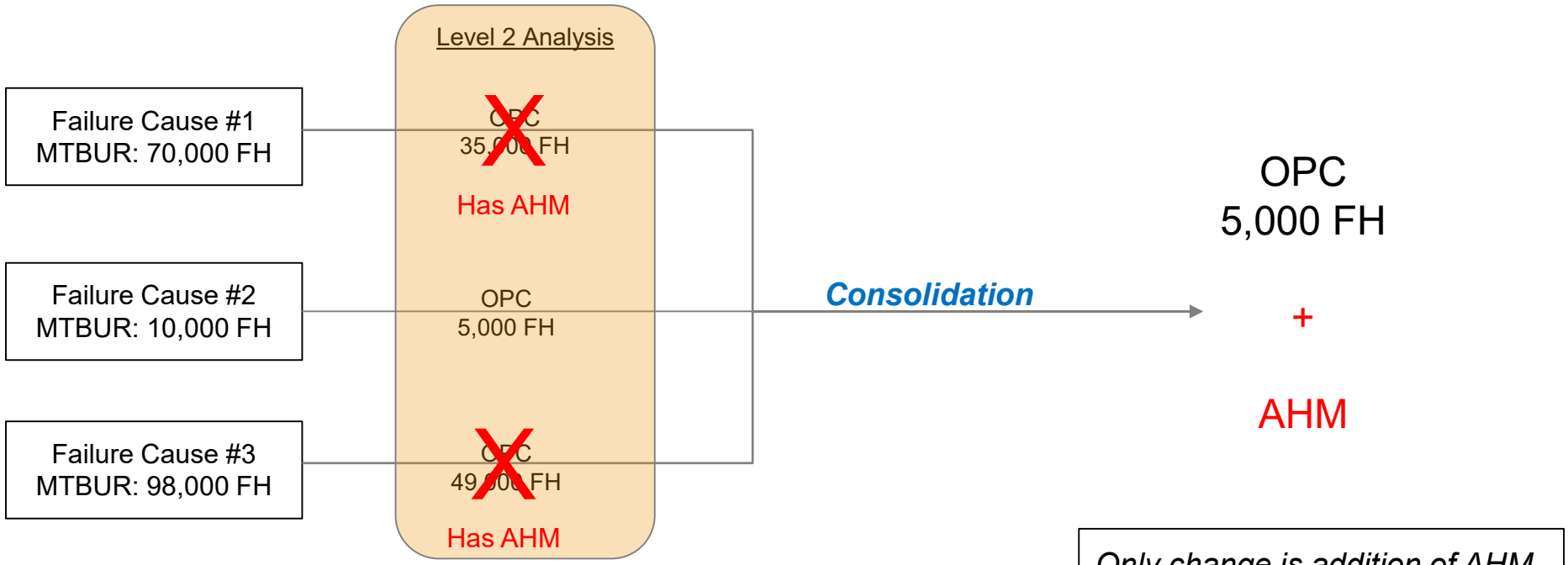
An AHM Hybrid is selected when multiple failure causes lead to the creation of a Classic Task but the AHM capabilities of the aircraft are only capable of providing detection of some of the failure causes and not all. The purpose of an AHM Hybrid selection is to pair AHM with a scheduled maintenance task that is less burdensome than the original classic task (e.g. different interval, reduced scope, etc.).

The current Level 3 logic requires that if Question 2-3-9.A (Is the AHM use effective?) is answered yes, an AHM Alternative or Hybrid will be selected and published within the MRBR. However, there may be situations where it would not be desirous to publish an AHM Hybrid because it would be less effective than the current Classic Task.

Example (Level 2)



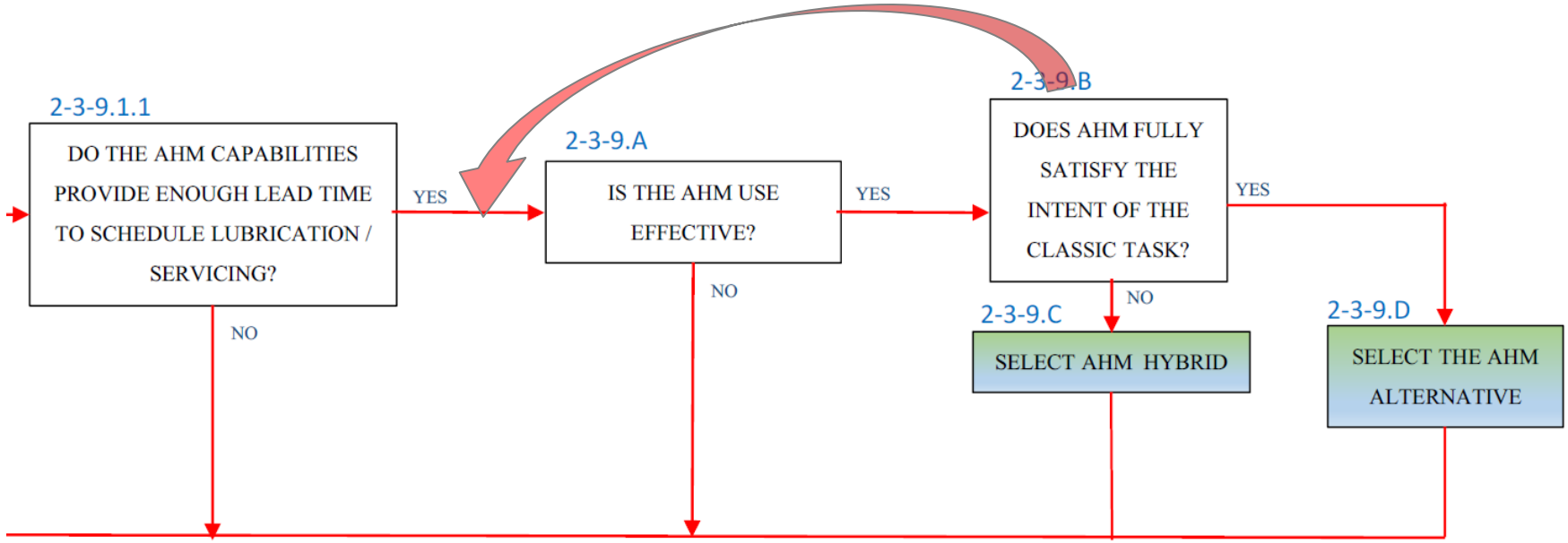
Example (Level 3 - Current)



Only change is addition of AHM.
No improvement to classic task.

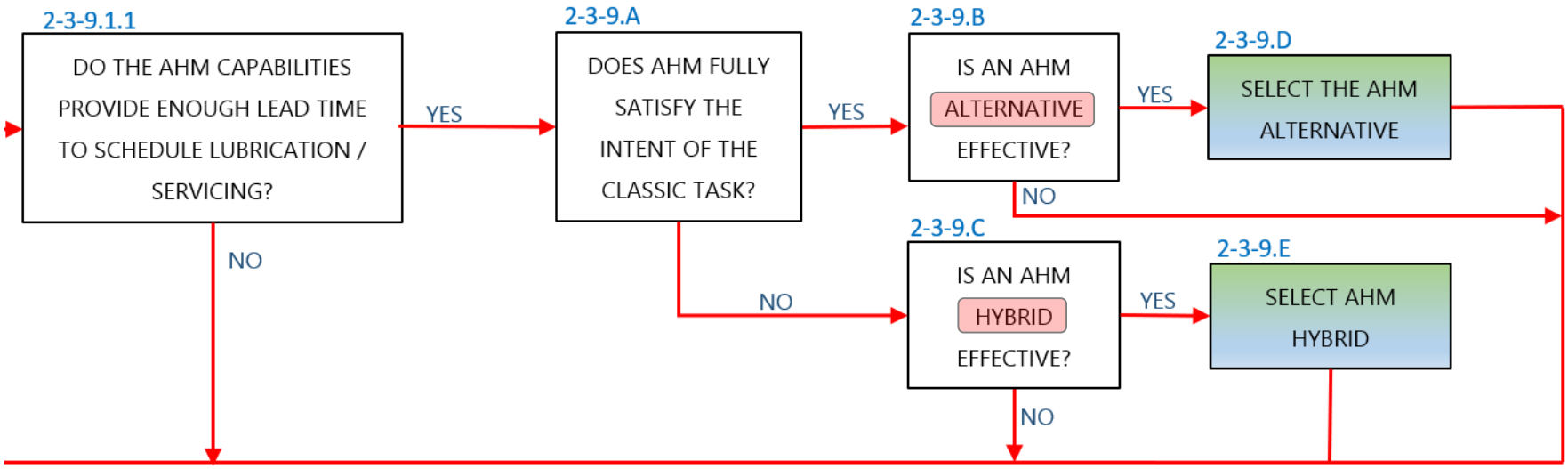
Problem

The effectiveness question is asked too early in the logic to have enough information to make that determination. It should be moved so that the effectiveness of the AHM is conditioned upon which type of AHM (Alternative or Hybrid) is being evaluated.



Recommendation

Update logic flow to move AHM effectiveness determination to follow AHM Alternative/Hybrid path selection. Each path will have its own effectiveness question necessitating the inclusion of an additional box in the logic. Existing logic boxes will need to be renumbered to accommodate the shift in logic flow.



Recommendation

Alternative and Hybrid Effectiveness questions similar with an addition for Hybrid path (in red):

The same criteria as in Level 2 are used in determining the effectiveness of AHM. The AHM must be as effective as or more effective than the classic task(s) selected in Level 2 analysis according to the FEC. In assessing the AHM effectiveness, the following criteria must be satisfied by AHM, as applicable, for:

- *FEC 8: it reduces the risk of failure to assure safe operations*
- *FEC 6&9: it reduces the risk of failure to an acceptable level*
- *FEC 7&9: the cost of AHM is less than the cost of potentially recurring failure*

The AHM Hybrid effectiveness should also evaluate the original Classic Task against the modified Classic Task with AHM. AHM Hybrids may be considered not effective if the Classic Task cannot be sufficiently modified with the introduction of AHM.

Airlines for America™

We Connect the World