JAA/FAA/TCA
International Maintenance Review Board Policy Board
Issue Paper

Title Use of Visual Aids (Video Scopes) for Visual Inspections

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Issue Use of video scopes or other specialized inspection aids requires an inspection level of Special Detailed Inspection (SDI) per interpretations of the SDI definition in the MSG-3 document. Inconsistencies exist, such as Detailed Inspection that are sometimes used for engine borescope inspections.

Problem In airplane areas that have limited access, video scopes are sometimes recommended to view the area more completely. However, the level of inspection intensity is not intended to be a close intensive inspection as required by an SDI, but rather an inspection to detect obvious damage, failure or irregularity, such as a General Visual Inspection (GVI). This can lead to misinterpretations in service.

The ever increasing availability and utilization of advanced technology, such as common video aids within the industry, as well as the increasing airplane areas with restrictive access, suggests a change to the MSG-3 document should be considered. Current definitions were written when remote vision systems were expensive and rare and the use of fiber optics or borescopes required qualified NDT personnel. An additional consideration is the ability of this equipment to accomplish inspections without complete entry into inaccessible, restricted and/or hazardous areas, thereby avoiding possible accidental damage to systems and structure.

Recommendation

Revise the existing definitions for General Visual and Detailed Inspections by adding "***or other visual aids"*** as depicted in Attachment 1.

Also a note should be added to state the following:

"For simplicity and safety/economic reasons, the General Visual Inspection (GVI) (without video scope) should be the first choice available to operators. Utilizing additional visual aids should be the second choice when operators are not able to perform direct visual inspection adequately due to access restrictions."

"The remote visual shall not be used to take measurements during a GVI. The orientation of the area being inspected must be verified and maintained during the inspection."

IMRBPB Position.

Important Note: The IMRBPB positions are not policy. Positions become policy only when the policy is issued formally by the appropriate National Aviation Authority (JAA, FAA or TCCA).

Attachments 2 and 3 contain examples where this has been allowed on existing Maintenance Review Board Reports (MRBRs).

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Attachment 1 - **Level of Inspection when utilizing a Video scope or other visual aids**

Situation

There are Structural and Zonal inspections that have very restrictive access that would benefit by allowing the use of inspection aids such as borescope/video probes to view airplane areas and conduct an adequate visual inspection. These inspections are not focused on specific airplane components, nor are they meant to be intensive inspections. These are inspections of airplane areas looking for obvious damage, failures or irregularities. The use of this equipment is simply as an inspection aid caused by access limitations and not meant to require a certain skill level. Boeing is proposing that equipment to enhance the accessibility of the area be permitted, and that the equipment being used to enhance accessibility not define the inspection intensity. The inspection definition being utilized for tasks of this nature is currently driving the MSG-3 users to list Special Detailed Inspection (SDI) or Detailed Visual Inspection (DET) per ATA MSG-3 document definitions, and not through the MSG-3 analysis intended level of inspection.

This issue impacts the ability of the Zonal Working Group to assign inspections in these limited access airplane areas because of SDI definition restrictions.

Additional Situation:

There are two issues that can arise when performing MSG-3 analysis in regards to task selection.

The first issue is assigning an inspection level based on “seriousness” or perceived importance of the item being inspected. These decisions are determined upstream in the MSG-3 logic. When selecting a task, the damage type, size and location are considered.

The second issue is assigning an inspection level based on the skill and training level of the person performing the task. These issues need to be handled by the operator or MRO. All references to skill levels have been carefully avoided or removed from the MSG-3 analysis document and virtually all PPH and MRB documents state that inspection tasks or inspection task codes do not imply skill level. Skill levels should not be involved in task selection; to do so will result in needlessly restricting the operator or MRO, or will result in an overly conservative initial maintenance program.

This IP will bring consistency to MSG-3 analysis task selection, as well as allow proper task selection for restricted access areas on the airplane.

The precedence has been set and positive in-service experience has proven the concept Of allowing video aides to perform GVI and DET inspections Other Boeing models (757, 777) have recommended these visual aids, inspection tools for Zonal and Structural items for GVI and DET inspections.

See Attachments 2 and 3.

In addition, in some engine borescope tasks, an SDI is not consistently utilized for existing Maintenance Review Board (MRB) documents.

Examples: Boeing MRBs for engine borescope tasks:

777 DET Detailed Inspection (borescope)
737NG DET (borescope)
747-400 DET (borescope)
767 IN (borescope)
757 IN (borescope)

717 SDI (borescope)
MD 90 DET (borescope)
MD 11 SDI (borescope)

Proposal:

Revise the MSG-3 document to allow use of video aids for GVIs and/or DETs in MRBR tasks, as applicable, when the subject inspection aids are being recommended. This will properly document the intended MSG-3 derived level of inspection. Should a GVI (with video scope) be a candidate for the Zonal program, the applicable Zonal task will be required to also call out the use of borescope or similar equipment. Other GVIs included in the same zone where video scope use is being recommended can remain “packaged” with the subject task.

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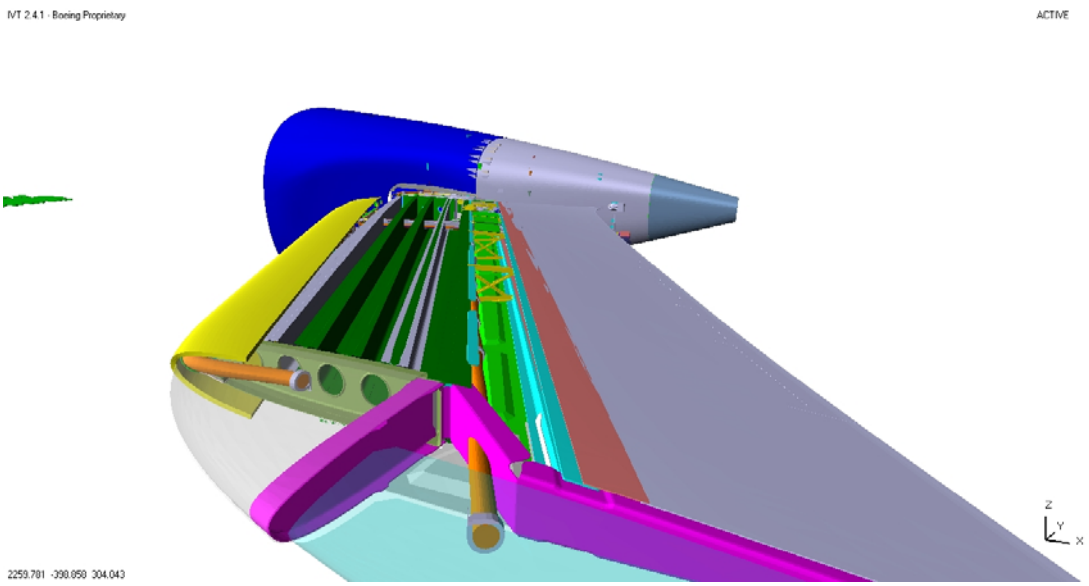
Revising the ATA GVI and DET definition to:

GENERAL VISUAL INSPECTION (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 or ***other visual aids*** 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.

Note:	***For simplicity and safety/economic reasons the GVI (without video scope) should be the first choice available to operators. Utilizing additional visual aids should be the second choice when operators are not able to perform adequate direct visual inspection due to access limitations.*** ***The remote visual shall not be used to take measurements during a GVI. The orientation of the inspection area must be verified and maintained during the inspection.***

DETAILED INSPECTION (DET)
An intensive examination of a specific item, installation or assembly to detect damage, failure or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, ***or other visual aids*** may be necessary. Surface cleaning and elaborate access procedures may be required.

Note:	***For simplicity and safety/economic reasons, the DET (without video scope) should be the first choice available to operators. Utilizing additional visual aids should be the second choice when operators are not able to perform detailed inspection adequately because access limitations.*** ***The remote visual aid shall not be used to take measurements during a DET. The orientation of the inspection area must be verified and maintained during the inspection.***



Example: 787 Horizontal Stabilizer Box

In this airplane area the only way to view the internal area is to inspect via the inspection holes. The level of inspection intended for both the Structural and Systems elements is GVI. If a Borescope is required in this area (SDI), then a GVI cannot be applied. The operator must then perform the inspection (with flashlight/mirror) through these holes without other special equipment. It is Boeing's position that this inspection level is not adequate.

The following table lists 787 zones that contain no systems and where it is recommended that a Borescope be used to do the interior inspection.

Zone No	Zone Title
323	Vertical stabilizer, front spar to rear spar
325	Rudder
326	Rudder tab (applicable only to -3 models)
331	Horizontal stabilizer - center section, left
334	Horizontal stabilizer, front spar to rear spar
336	Elevator - Left
341	Horiz. stab, center section, right
344	Horiz. stab, front spar to rear spar
346	Elevator - Right
526	Slat no. 1
543	Wing tip (INBOARD OF CLOSURE RIB)
553	Spoiler no. 7
554	Spoiler no. 6
555	Spoiler no. 5
556	Inboard flap
557	Flaperon
562	Spoiler no. 4
563	Spoiler no. 3
564	Spoiler no. 2
565	Spoiler no. 1
566	Outboard trailing edge flap
567	Aileron
626	Slat no. 12
643	Wing tip (INBOARD of CLOSURE RIB)
653	Spoiler no. 8
654	Spoiler no. 9
655	Spoiler no. 10
656	Inboard Flap
657	Flaperon
662	Spoiler no. 11
663	Spoiler no. 12
664	Spoiler no. 13
665	Spoiler no. 14
666	Outboard trailing edge flap
667	Aileron

MRB ITEM NUMBER	PGM	ZONE	ACCESS	INTERVAL		APPLICABILITY		TASK DESCRIPTION
				THRESHOLD	REPEAT	APL	ENG	
53-611-00	S	131 132	NOTE	6000 FC 1125 DY NOTE	6000 FC 1125 DY NOTE	300 300ER NOTE	ALL	*INTERNAL - GENERAL VISUAL:* Area above Wing Center Section Area above Wing Center Section - Area of inspection includes structure beneath galley only. AIRPLANE NOTE: Applicable to 777-300 and 777-300ER airplanes with optional side or center galley installed over the wing INTERVAL NOTE: Whichever comes first ACCESS NOTE: Inspection aids such as borescope, videoprobe, etc. may be used.

MRB ITEM NUMBER	PGM	ZONE	ACCESS	INTERVAL		APPLICABILITY		TASK DESCRIPTION
				THRESHOLD	REPEAT	APL	ENG	
55-508-00	S	310	311BL	16000 FC 3000 DY NOTE	16000 FC 3000 DY NOTE	ALL	ALL	*EXTERNAL - DETAILED:* Fuselage - BS 2150-2570.3 (Section 48) Fuselage - BS 2150-2570.3 (Section 48) - SAFETY ROD, internal surface. Inspection aids such as borescope, video probe, etc.should be used. INTERVAL NOTE: Whichever comes first.