Comment Response Tool



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Title	Regular update of AMC-20: AMC 20-152 on Airborne Electronic Hardware and AMC 20-189 on Management of Open Problem Reports
NPA Number	NPA 2018-09

General Aviation Manufacturers Association (jarcher@gama.aero) has placed 48 unique comments on this NPA:

Cmt#	Segment description	Page	Comment	Attachments
60	(General Comments)	0	The following comments are consolidated industry comments provided by members of AIA, ASD and GAMA (Reference: GAMA18-61 dated October 3rd, 2018).	
67	(General Comments)	0	Major Comment For the clarity of the document it must be paid attention to the use of "applicant" or "stakeholder" terms which are mixed. The consequence is the difficulty to understand for whom the guidance is applicable (e.g in section §5.2, "applicant" is used whereas section §7.1 states that PR management should be performed by the stakeholder at each level) Furthermore, in refining requirements from aircraft to system to AEH/Software items there are different stakeholders and there is a hierarchy of stakeholders involved in assessing problems. However, the notion of "next level" is unclear. The more appropriate term may be "upper level". Alternatively, there may be a case where the impact may be between different stakeholders at the same level e.g., AEH and Software processes for the same equipment. Proposed resolution: Check correct use of "Applicant" and "Stakeholder" and revise as necessary. Add a definition of "stakeholder" to section 4.1. Include a reference to the differing/hierarchical levels of stakeholder as defined in section 7, or move that section 7 descriptions into the definition of stakeholder.	
111	(General Comments)	0		
70	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 2. Applicabili	49	Major Comment 2 Commented text: This [AMC]/[AC] is not applicable to electronic equipment embedded in airborne systems which could cause or contribute only to Minor failure conditions Comment: What about software and AEH? What means "electronic" equipment?	
			Proposed resolution: This [AMC]/[AC] is not applicable to electronic equipment embedded in airborne systems, software and AEH embedded in those systems, which could cause or contribute only to Minor failure conditions or to failure conditions having No Safety Effect	

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88	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 2. Applicabili	49	Major Comment 2 Commented text: is also not applicable to component partitions which could Comment: component partitions is ambiguous Rationale: Component refers to electronic component (device), to AEH ? To be clarified Proposed resolution: Remove component This [AMC]/[AC] is also not applicable to component partitions which could cause or contribute only to Minor failure conditions or to failure conditions having No Safety Effect.	
105	AMC 20-189/AC 20- 189: Management of Open Problem Reports — 2. Applicabili	49	Editorial Sec. 2 Change last sentence in section 2 to: "This [AMC]/[AC] is not applicable to electronic equipment software, and AEH, embedded in airborne systems which could cause or contribute only to Minor failure conditions or to failure conditions having No Safety Effect."	
110	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 2. Applicabili	49	Editorial 2 To improved clarity: Recommend editorial change as follows. "Hazardous" should be replaced with the text "Severe- Major/Hazardous" as it is referenced that way in ARP4761.	
97	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 3. Backgrou	49	Editorial 3.1 There is a formatting issue. Section labeled as 3.1 should be on a new line.	
71	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Major Comment 4.3 Commented text: Note: The 'potential safety effect' in this definition is based on Initial Airworthiness Comment: Not sure it helps external reader to better understand the definition Proposed resolution:	
			remove this note	

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72	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Major Comment 4.3 Commented text: 'Process': a PR recording a process non-compliance, deficiency or deviation Comment: Deviation is outside the scope of this AMC Justification: Why having a dedicated OPR for a deviation : either a deviation is accepted (method used is not the one described in plans but the objective is covered): so nothing to do, just trace it in the HAS or the next issue of PHAC. No OPR Or a deviation is not accepted, because it does not fully cover the failed objective (e.g. verification is not complete) then it becomes an OPR with a potential safety impact ("safety") ?It is no more a deviation At the very beginning (when process deficiency is detected) it could be a PR. When analyzed and after decision it becomes either a deviation or a PR (that could be solved: complement of verification to fill the gap) or becomes an OPR of type "safety" if not solved Proposed resolution: Check if deviation is used elsewhere in the doc and propose to delete all references to deviations in the text (except "significant deviations", see GM 4.2.3 & 4.2.4)	
80	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Minor Comment 4.1 Definition of Problem Report: It is assumed that a Problem Report is a class that includes both closed and open Problem reports. If this assumption is correct, the word "resolution" in this definition of Problem Report implies that the correction is recorded with the report. If the Problem Report is open, you wouldn't necessarily have a resolution at the time of recording a Problem. Suggested revision: "A means to identify and record the description and potential resolution of anomalous behavior, process non-compliance"	
84	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Minor Comment 4.3 Commented text: "'Other': a PR having no potential safety impact, no potential functional impact, and not linked to a process deficiency or a deviation or to a documentary deficiency." Comment: It is unclear what could be classified "other" based on the definition of the other PR types, since as per definition, "Other" do not sound like an issue. May a bad behavior on an item part not activated (i.e. unused/deactivated SW/HW function) be considered as "Others"?	

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39	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Minor Comment 4.2 aim of this section is not clear It is not clear that PR/OPR may have many other states depending on configuration management process and tool used by the applicant (initiated, analysed, assigned, reviewed, implemented, reanalysed). Proposed resolution: To move it as sub-definitions of "problem report(PR)" in section 4.1	
91	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Minor Comment 4.3 & 6 The definitions for OPR "Functional" and "Process" classifications discussed in Sections 4.3 and 6 leave a gap in coverage of Verification Procedure deficiencies that affect requirements and/or requirement verification, but do not necessarily directly affect implementation or functional behavior. This is presumably of sufficient magnitude that A[M]C 00-71 Section 4.2.3 specifies "An example of an OPR that should not be classified as a 'Process' PR is one related to a requirement that was not completely verified because of a process deficiency." Suggest that the issue of OPR classification for deficiencies uncovered in Verification activities (such as Procedure deficiencies or errors), which are also specified in SAE ARP4754A Section 5.5.6.4, should be clarified in the classification guidance of the A[M]C 20-189 text, without sole reliance on the A[M]C 00-71 content.	
98	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Editorial 4.1 Definition of Open Problem Report- there should be a space added after 'Closed'.	
100	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Editorial 4.2 Change the definition of "Resolved" to "A problem report that has been corrected or fully mitigated, but for which resolution has not been reviewed and confirmed."	
101	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Editorial 4.3 Change the definition of "Documentary" to "a PR linked to a deficiency in a life cycle data item but not linked to a process deficiency or deviation. This includes typographical or editorial defects in life cycle data items."	
109	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 4. Definitio	49 - 51	Editorial 2 To improved clarity: Recommend editorial change as follows. "Hazardous" should be replaced with the text "Severe- Major/Hazardous" as it is referenced that way in ARP4761. To improved clarity: Recommend editorial change as follows. "Hazardous" should be replaced with the text "Severe-Major/Hazardous" as it is referenced that way in ARP4761.	

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52	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 5. Problem Report Manageme	51	Major Comment 6.1.2 & 6.1.3 Mitigations that are controlled by a higher-level stakeholder, including any operational mitigation, should not be considered in the current level stakeholder's classification. Stakeholders other than the type certificate (TC)/supplemental type certificate (STC) level applicant should consider the potential worst-case effect (as anticipated by the stakeholder) of the OPR in the classification. Classifying OPR pending on their impact on the aircraft without considering any higher-level stakeholder mitigation is a significant change in the current practices and a burden for industry and authorities: OPR classification for impact on aircraft and operations should be performed at relevant product/article levels Proposed resolution: Remove sections 6.1.2 & 6.1.3	
66	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 5. Problem Report Manageme	51	Major Comment 5.2 "Additionally, an applicant should identify and correct any related systemic process issues." This implies that systemic issues must be fixed right away, however, should this instead be clarified to have the fix occur in the next change/update? In addition, this could work with AC 20-115D Sections 5. and 9. to guide updates regarding process into being fixed before or as part of legacy updates that decide to upgrade development to DO-178C. Suggested revision: Update the wording to: "Additionally, an applicant should identify any systemic process issues and establish a plan to correct the issues in a future update."	
73	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 5. Problem Report Manageme	51	Major Comment 5.2 OPR after approval should be managed as per EASA part 21.A.3B(b).It could be inconsistent with the definition of Intital airworthiness as mentioned in 4.3 Proposed resolution: To be removed or to indicate that the existing continued airworthiness processes apply	
93	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 5. Problem Report Manageme	51	Minor Comment 5.3 What is meant by a PR that "cannot be resolved at the current stakeholder level" as distinguished by a PR that currently has not yet been resolved at the current stakeholder level but ultimately will be at a future time? If there really is a distinction, add a note to clarify the meaning. Otherwise, replace "PR that cannot be resolved" with "PR that is not resolved".	

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169	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 5. Problem Report Manageme	51	Minor Comment 5.2 "Identification of the affected configuration item(s) (for example, the item part number) or of the affected process(es);"	
			PRs may be shared across more than one product line that affects more than one part number that are fixed at differing times, using part numbers in OPR listings then becomes more maintenance than using common names. The example should be expanded to consider title or something besides just part numbers to identify the affected items.	
			Recommended change: Update the wording to: "Identification of the affected configuration item(s) (for example, the item part number, component name, artifact name) or of the affected process(es);	
63	AMC 20-189/AC 20- 189:Management of	51 - 53	Major Comment	
	Open Problem Reports — 6. OPR Manageme	33	6.4 Reporting: an OPR summary report (e.g. as contained in Software/Hardware Accomplishment Summaries or system-level OPR reports) should be prepared and provided to the affected stakeholder(s), and to the certification authority upon request	
			One can understand that all OPRs coming from all the different levels of development and integration have to be escalated at applicant level. Compiling all the OPRs at aircraft level will be a huge burden for applicant and authorities.	
			Proposed resolution: an OPR summary report (e.g. as contained in Software/Hardware Accomplishment Summaries or system-level OPR reports) should be prepared and provided to the affected stakeholder(s), and to the certification authority upon request. The OPR summary should focus on the OPRs affecting the next integration level (Potential Safety and functional). In addition when OPRs are mitigated at one level they should remain identified at this level and not escalated. The summary report should contain the following information for each OPR:	
65	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Major Comment 6.2 Item 3. The determination of underlying cause may not always be required to be able to identify the mitigation of accepting the OPR, and in reality may be much more time consuming than the actual resolution itself. However, the applicant can understand the nature of the problem sufficiently as to be define a sound operational mitigation or acceptable justification, even without fully understanding the underlying cause.	
			Suggested revision: 3. For 'Potential Safety' and 'Functional' OPRs, the applicant should have sufficient understanding of the underlying technical cause of the problem to be able to define a sound operational mitigation or acceptable justification.	

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69	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Major Comment 6.4.6 items 4 & 5 For clarity and completeness: Recommend change as follows: OPR assessment results (per paragraph 6.2), including: 1. For all OPRs: 1.a The classification of each OPR 1.b Relationships that are known to exist for other OPRs 2. For OPRs classified as "Potential Safety": 2a Description of any mitigations or justifications used to substantiate the acceptability of the safety impact (per paragraph 6.3) 2b Functional limitations and operational restrictions, if any 3. For OPRs classified as "Functional": 3a Description of any mitigations or justifications used to reduce the safety impact to Minor or No Safety Effect 3b Functional limitations and operational restrictions, if any 4. For OPRs classified as "Process", description of the extent or nature of process non-compliance or deficiency that might contribute to not satisfying the applicable development assurance objectives 5. For OPRs classified as "Other", description of justification that the error cannot cause a functional failure.	
74	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Major Comment [6.5.1 & 6.5.2] These two sections are addressing topics already addressed and covered by the existing Continued airworthiness processes Proposed resolution: To be removed or to indicate that the existing continued airworthiness processes apply	
85	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Minor Comment 6.1.4 Commented text: "The classification of an individual OPR may differ from one stakeholder level to another, depending on the known mitigations at the time of classification." Context is missing for this sentence (mitigation at what level? What type of OPR). So no added value and may add confusion Recommended change: Sentence to be removed	
86	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Minor Comment 6.5.2 It is more related to new OPRs	

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87	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53		
92	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Minor Comment 6. The definitions for OPR "Functional" and "Process" classifications discussed in Sections 4.3 and 6 leave a gap in coverage of Verification Procedure deficiencies that affect requirements and/or requirement verification, but do not necessarily directly affect implementation or functional behavior. This is presumably of sufficient magnitude that A[M]C 00-71 Section 4.2.3 specifies "An example of an OPR that should not be classified as a 'Process' PR is one related to a requirement that was not completely verified because of a process deficiency." Suggest that the issue of OPR classification for deficiencies uncovered in Verification activities (such as Procedure deficiencies or errors), which are also specified in SAE ARP4754A Section 5.5.6.4, should be clarified in the classification guidance of the A[M]C 20-189 text, without sole reliance on the A[M]C 00-71 content.	
95	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Minor Comment 6.5 Add following text to section 6.5: "The OPR summary report as described here is acceptable for use in a DO-178B/C Software Accomplishment Summary or a DO-254 Hardware Accomplishment Summary."	
102	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Editorial 6.1.1 Editorial change as follows. Change "5. 'Other' Impact" to "5. 'Other' "	
106	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Editorial Sec. 6.4.6 Editorial change as follows. Use consistent capitalization convention of the five PR states throughout AC 20-189 and AC 00-71.	
165	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 6. OPR Manageme	51 - 53	Minor Comment 6.4.6 - item 4 The phrase "any mitigations implemented" implies that the mitigations have been implemented, when sometimes the mitigations are available to apply by configuration or use. An example would be to not configure a particular feature, or to take an action to reset a page. Suggested revision: change "any mitigations implemented" to "any mitigations available or implemented"	

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8	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 7. Stakeholder Responsibiliti	53	Major Comment 7.1 This paragraph includes the statement, "The applicant has responsibility for the overall PR process for all involved stakeholders." This statement should recognize that some stakeholder levels (e.g. [ETSO]/[TSO]) will have an approved PR management process that does not require oversight by an applicant at a higher stakeholder level. By stating that an applicant is responsible for the PR process of all stakeholders, the A(M)C implies that oversight is required by the applicant for all lower level stakeholders. At the 24-25 July 2018 EASA/FAA//Industry SW/AEH Harmonization/Streamlining Steering Committee Meeting, industry demonstrated that (E)TSO approval holders with accepted development assurance processes are subject to multiple audits of the same processes by higher level applicants. The 24-25 July 2018 meeting resulted in agreement on Objective #10- the acceptance of previously approved data (established Means of Compliance) against the same requirements. A(M)C-189 is intended to cover multiple stakeholder levels with the same means of compliance, and therefore is a good place to recognize this objective. Proposed resolution: "The applicant stakeholder has responsibility for the overall PR process for involved stakeholders without a previously approved PR process."	
00	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 7. Stakeholder Responsibiliti	53	Minor Comment 7.1 PR management (per paragraph 5) should be performed by the stakeholder at each level. It is not applicable to authorities (that are considered as stakeholder according to 7. list)	
94	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 7. Stakeholder Responsibiliti	53	Minor Comment 7. Because the certification authority is identified as one of the stakeholder levels, this section implies that the certification authority has the responsibility for performing a PR management and OPR management. Certainly, this is not really the case. Revise the responsibility section to exclude certification authority even if they are a kind of stakeholder.	
103	AMC 20-189/AC 20- 189:Management of Open Problem Reports — 8. RELATED REGULATORY, ADVISORY, AND INDUSTRY MATERI	54 - 58	Editorial Sec. 8(c) Editorial changes as follows: 1) Add () after AC 20-115, AC 20-152 as is done in section 8(b) for the AMCs. 2) Add AC 23.1309 and 25.1309 as is done in AC 00-71 section 5(b)	
107	AC 00-71:Best Practices for Management of Open Problem Reports — 2. Audien	60	Minor Comment AC 00-71 Sec. 2 Editorial changes as follows. Change last sentence in section 2 to: "This AC is not applicable to electronic equipment software, and AEH, embedded in airborne systems which could cause or contribute only to Minor failure conditions or to failure conditions having No Safety Effect."	

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83	AC 00-71:Best Practices for Management of Open Problem Reports — 3. Definitio	60 - 61	Minor Comment AC 00-71 Sec. 3.1 to 3.3 For consistency, ensure the definitions in AC 00-71 identically match the corresponding definition in AC 20-189.	
167	AC 00-71:Best Practices for Management of Open Problem Reports — 3. Definitio	60 - 61	Minor Comment AC 00-71 Sec. 3.1 to 3.3 For consistency, ensure the definitions in AC 00-71 identically match the corresponding definition in AC 20-189.	
64	AC 00-71:Best Practices for Management of Open Problem Reports — 4. BEST PRACTIC	61 - 63	Major Comment [<ac>4.2.]1 Type 'Potential Safety': the term "contributing to" increases significantly the scope of OPRs belonging to the class 'Potential Safety'. E.g. an OPR having a minor effect standalone can, combined with another one, lead to a Major or higher FC. Assessment of combined OPR may be a burden for industry and authorities Proposed resolution: Remove "contributing to"</ac>	
81	AC 00-71:Best Practices for Management of Open Problem Reports — 4. BEST PRACTIC	61 - 63	Minor Comment AC 00-71 [<ac>4.2] para 5 DO-248C does not define Type 4 as including non-functional faults (type 2) and clearly provides an example of typographical errors. We have seen some organization use this logic to categorize problems within the code such as non-compliance to standards as 'Type 4' and justify not reviewing with the OEM AR based on categorization of 'Other'. Recommended change: [<ac>4.2.]5. Type 'Other': this typically maps to 'type 2' and 'type 4' PRs, but may not be limited to those types. It serves as a default class to cover any remaining PRs that do not relate to any potential safety, potential functional, process or documentary impact.</ac></ac>	
82	AC 00-71:Best Practices for Management of Open Problem Reports — 4. BEST PRACTIC	61 - 63	Minor Comment AC 00-71 [<ac>4.1.]3 To improved clarity: Recommend editorial change as follows. Change "Typical review boards used for PRs classified as 'Potential Safety', 'Functional' or 'Process' PRs may not be needed for PRs that are classified as 'Documentary' or 'Other', where peer reviews may be sufficient." to: "PR assessment of PRs classified as 'Potential Safety', 'Functional' or 'Process' would typically be assessed by a review board. PR assessment of PRs classified as 'Documentary' or 'Other' may be performed within the peer review process instead of a review board."</ac>	

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99	AC 00-71:Best Practices for Management of Open Problem Reports — 4. BEST PRACTIC	61 - 63	Editorial AC 00-71 [<ac>4.2] para 2 The last sentence is also grammatically incorrect Recommend changes: [<ac>4.2.]2. Type 'Functional': this typically maps to 'type 1A' or 'type 1B'. That is, a problem (with any Level of software) that results in a failure with no adverse impact on safety. One way of creating the link between these two types and the [AMC]/[AC] 20-189 classification scheme is to consider 'type 1A' for Functional PRs whose consequences can potentially lead to a Minor failure could be categorized as 'type 1A' and 'type 1B' for Functional PRs having No Safety Effect could be categorized as 'type 1B'. Two separate classes could therefore be created in the applicant's classification scheme to ease the mapping: problems having an operational impact leading to a Minor failure condition could be classified separately (e.g. 'Functional 1') from the ones having No Safety Effect (e.g. 'Functional 2').</ac></ac>	
108	AC 00-71:Best Practices for Management of Open Problem Reports — 4. BEST PRACTIC	61 - 63	Editorial AC 00-71 [<ac>4.1.]1 Editorial changes as follows. Change [<ac>4.1]1 to "PR Recording: a means to document problems during the life cycle processes."</ac></ac>	
104	AC 00-71:Best Practices for Management of Open Problem Reports — 5. Related Publicatio	63 - 65	Editorial AC 00-71 Sec. 5(b) Editorial change as follows. Add () after AC 20-115, AC 20-152 as is done in section 5c for the AMCs.	

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