

**INDUSTRY QUESTIONS AND RESPONSES – JANUARY 29, 2013**

Spec Para. COMMENT/RESPONSE

1.0 COMMENT: The specification states that SFF may be used in rotary wing, fixed wing, surface, and subsurface applications. Seems to conflict with the SOW para. 1.1, which indicates that SFF is for US Army Shadow UAS. Confirm that specification is limited to US Army Shadow UAS.

RESPONSE: Though the procurement is for the USA Shadow, the statement is correct that the device may be used on other platforms in the future.

3.0 COMMENT: Please confirm that ADS-B Out is a growth requirement and is not required at time of proposal submittal.

RESPONSE: The ADS-B Out requirement is correct as stated in the documentation. It is not a growth requirement.

3.0 COMMENT: The requirements do not address the protocol, message formats or specific ports required to get M5 position/velocity/time (PVT) and ADS-B PVT data into the transponder. Does the Government intend to publish details of a non-proprietary interface for getting M5 and ADS-B data into the SFF, or allow suppliers to use their proprietary interfaces?

RESPONSE: The Government will not provide software Interface Control Documents (ICDs). It is a requirement that the offeror defines the interfaces and provides the software ICDs.

3.1 COMMENT: The specification requires configuration of some of the transponder's I/O based on ground/open pin information provided to the transponder at power up". No information on what I/O's would need to be configured, what is the means of providing configuration info on power up, and what are the desired set of I/O configurations. The RT-1716 transponder being replaced on the Shadow does not currently have this capability. Recommend this requirement be removed as it is not required for the US Army Shadow UAS. This requirement is also called out in para. 3.8.3.3.

RESPONSE: The requirement was reviewed and removed from the specification.

3.6 COMMENT: Is the RFF transponder referenced in the AQP document, the same as the SFF? Please clarify relationship of RFF Transponder and SFF.

RESPONSE: A definition for the Reduced Form Factor (RFF) was added to the specification as follows:

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Reduced Form Factor (RFF) – previous term used for the Small Form Factor Transponder (SFF).

3.7.1 COMMENT: The specification states only the SFF max weight. State the desire that the SFF weight be as low as possible.

RESPONSE: Evaluation criteria will be stated in the Section M of the Solicitation, not the specification.

3.7.2 COMMENT: The specification states only the SFF max dimensions. State the desire that the SFF volume be as small as possible within the given envelope.

RESPONSE: Evaluation criteria will be stated in the Section M of the Solicitation, not the specification.

3.7.3 COMMENT: The specification requires that the SFF accommodate a tray mount installation. There is no description of the tray and a tray is not used on Shadow. Since a tray is not employed on the UA Army Shadow UAS, suggest the tray mount requirement be replaced with requirement for secure mounting provisions.

RESPONSE: The specification was edited to further clarify the requirements as follows:

The transponder shall be designed for either a hard mount or tray mount installation. If a tray is required for mounting, the offeror shall include the tray with their design. Any tray would be required to meet the physical constrictions of the SFF specification (i.e. dimensions, weight, etc) and be included in the SFF space and weight allocation.

3.7.7 COMMENT: Does the continuous power consumption apply to the transponder only or the transponder with crypto installed? Recommend stating power consumption with the crypto.

RESPONSE: The specification was edited to further clarify the requirements as follows:

The transponder with crypto installed shall operate on 28 Vdc aircraft power having characteristics and limits of MIL-STD-704C and MIL-STD-704F as specified in paragraph 3.67.7.2 of this specification.

Continuous power consumption of the SFFT with crypto installed during operational use shall be less than 30W under standard conditions and 33.6W under the worst-case combination of service conditions and transmitter duty cycle.

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3.7.7.2.3 COMMENT: Requirement for 704A is inconsistent with AQP para. 6.3 which requires worst case 704 A thru F. Clarify requirement.

RESPONSE: The requirement in the referenced MIL standard is consistent throughout the revisions. The specification was edited to further clarify the requirements as follows:

Voltage Distortion Spectrum shall be IAW Figure 7 of MIL-STD-704F.

3.8.2 COMMENT: Definition of appliqué not universal. Further define appliqué by stating that it is removable from transponder without having to disconnect or unmount the transponder from the platform.

RESPONSE: Section 6.2 of the specification provides the definition of cryptographic appliqué. The definition was reviewed and is considered adequate.

3.8.3.2 COMMENT: Section 3.8.3.2 and Table 2 of the specification call out physical connectors. Given the platform interconnects will need to be changed to accommodate ADS-B and Mode 5 signals, would the Navy consider other connector types. Remove the requirement for specific physical connectors. Add general interconnect requirements, e.g., "The SFF shall have a ruggedized multipin connector(s) to accommodate the platform interface given in Table 3. The SFF shall have two ruggedized coaxial RF connectors to accommodate the platform top and bottom antenna coax interface."

RESPONSE: The requirement was reviewed and is correct as written in the specification. The connector on the Shadow platform is as defined in Table 2 of the specification. An adapter may be used to interface with the J1 connector. If the adapter provides the same I/O, this will be considered meeting the specification requirements. The adapter must be used at the fit check and fit within the space requirements.

3.8.3.3 COMMENT: Section 3.8.3.3 and Table 3 of the specification call out very specific I/O assignments for the transponder. Also, some I/Os seem to be redundant (1553 Bus 1T+), missing (KIV Interlock), or inappropriate (+28VDC Switched Out – Supports KIT-1C; M4/5 Refuel Hold - Not used by KIV-77). Are the I/O assignments intended to be a threshold requirement or are they given as an example? Will the Navy consider I/O signals mapped to a smaller, lighter connector?

1. Delete the specific connector designation & pin assignments in Table 3.
2. Add Platform Suppression I/O to Table 3.
3. Delete redundant 1553 Bus 1T+ (now assigned to J1-16).

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4. Delete +28VDC Switched Out (now assigned to J1-25)
5. Add KIV Interlock signal.
6. Delete Gillham D2 input (see comment on 3.11.9)
7. Delete M4/M5 Refuel Hold
8. Eliminate "Spares" from Table 3 list.

RESPONSE: The I/O configuration given in Table 3 is not a threshold. The connector requirement was addressed in response 3.8.3.2. Section 3.8.3.3 was reviewed and deleted. In Table 3, items J1-10-16 were revised. The connector inputs/outputs requirements are as defined in the specification. Spare pins are available for other uses if needed.

- 3.8.3.3 COMMENT: Would the Government consider alternate approaches to input Mode 5 and ADS-B PVT?

RESPONSE: Section 3.8.3.3 was reviewed and deleted.

- 3.8.3.4 COMMENT: The specification requires the suppression interface be available on the J2 connector. Delete reference to specific physical interconnect.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.8.5.1 COMMENT: The specification requires the transponder accept and distribute Mode S data via Ethernet interface. This is inconsistent with para. 3.8.4.2 where Ethernet is stated as a growth interface. Replace "RS-485 and Ethernet" with "Control and Status interface."

RESPONSE: The specification was edited to further clarify the requirements as follows:

The transponder shall accept Mode S Uplink data and distribute Mode S Downlink data including Mode S Specific Protocols (MSP), IAW International Civil Aviation Organization (ICAO) Annex 10, Volume III and IV, and RTCA/DO181E paragraph 1.4.3.2, via RS-485, and future Ethernet interfaces.

- 3.8.5.1 COMMENT: The specification references Mode S Specific Protocols. This is typically a Mode S Level 3 requirement. Is this a US Army Shadow requirement?

RESPONSE: Mode S level 3 is not a requirement. Mode S level 2 enhanced surveillance is required.

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COMMENT: Does Mode S Downlink data mean GNSS Data for DF-17 (ADS-B Out) via a RS-485 interface?

RESPONSE: This is not what is meant by Mode S downlink data. The uplink and downlink terms were reversed in the specification. The specification requirement was corrected to state Downlink data is the Mode S level ES.

COMMENT: What Mode S Uplink data is required to be distributed on the Shadow UAS? Please clarify requirement, by identifying specific Mode S uplink and downlink data required for the Shadow UAS application.

RESPONSE: The specification was edited to further clarify the requirements as follows:

The transponder shall accept Mode S Uplink data and distribute Mode S Downlink data including Mode S Specific Protocols (MSP), IAW International Civil Aviation Organization (ICAO) Annex 10, Volume III and IV, and RTCA/DO181E paragraph 1.4.3.2, via RS-485, and future Ethernet interfaces.

3.9.1 COMMENT: The specification requires accepting the TOD via Ethernet interface. This is inconsistent with para. 3.8.4.2 where Ethernet is stated as a growth interface. Replace "RS-485 and Ethernet" with "Control and Status interface."

RESPONSE: The specification was edited to further clarify the requirements as follows:

The transponder shall accept TOD over the RS-485 and future Ethernet interfaces with or without the GNSS 1-pulse per second (time synchronization pulse) timing signal.

3.11.2.2 (SECTION HAS BEEN DELETED)

3.11.5.2 COMMENT: The specification requires operation into an antenna impedance mismatch of up to 3.1:1 VSWR. Assume this is the VSWR measured at the SFF antenna ports. Recommend replacing 3.1:1 with 2.5:1 or adding words that acknowledge operation above 2.5:1 may cause BIT faults.

RESPONSE: The requirement in the specification was reviewed and is correct as written.

3.11.9 COMMENT: A transponder that does not use a Gillham D2 bit is limited to an altitude of 62,800 ft. Since the US Army Shadow ceiling is well below this altitude, is it acceptable to not use the Gillham D2 bit?

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RESPONSE: The use of the Gillham D2 bit is not required. A maximum altitude of 62,800 feet is acceptable.

- 3.11.9.5 COMMENT: SFF Are discrete altitude interlock's the only acceptable way to verify altitude? Will the Government allow for alternate methodologies, i.e. a SW check for invalid Gilham codes during Continuous BIT? This check is more thorough than a simple Altitude Interlock test, as it can detect defective altitude data caused by broken wires, shorted connector pins, etc. which could cause bad altitude to be broadcast. Like the interlock discrete, it will always detect altimeter not installed.

RESPONSE: The specification has been modified to allow for alternative methods for checking for the altimeter. Any alternative method will need to be defined in the proposal along with supporting data.

- 3.12.1 COMMENT: To reduce weight, allow BIT initiation via control/status bus.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.12.1.1 (SECTION HAS BEEN DELETED)

- 3.12.1.2 COMMENT: To reduce weight, allow Crypto Battery Low status via control/status bus.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.13.1 COMMENT: This signal is named Power Relay Enable in Table 3. Rename Power On/Off discrete signal to Power Relay Enable.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.13.3.2 COMMENT: 1. The requirement seems to imply that the Power On and Emergency are enabled simultaneously. Is this correct?

RESPONSE: The requirement was reviewed and is correct as written in the specification. The emergency operation was selected when the transponder was off. Then the transponder is powered on.

COMMENT: 2. Replace "...the transponders power-up BIT... shall be bypassed" with a maximum time to be operational under this condition.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

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3.16.1 COMMENT: This requirement is for TSO certification. At the Industry Day Q&A, it was stated that the Army would be self-certifying the transponder and that TSO was not required. Is a TSO required? Is this a future (growth) requirement? Please clarify TSO requirement and timing of same.

RESPONSE: The specification was edited to further clarify the requirement as follows:

The transponder shall be TSO certified IAW TSO-C112d and TSO-C166b by the equipment supplier. If the transponder is not TSO certified, the equipment supplier shall provide documentation required in section 3.16.2 and 3.16.3.

3.16.2 COMMENT: If TSO is not required, does SW need to be compliant to RTCA/DO-178B Level C? Is this a future (growth) requirement? Please clarify requirement.

RESPONSE: See the response to comment 3.16.1

3.16.3 COMMENT: If TSO is not required, does FW need to be compliant to RTCA/DO-254 Level C? Is this a future (growth) requirement? Please clarify requirement.

RESPONSE: See the response to comment 3.16.1.

3.17.1 COMMENT: Recommend Mode S address be entered by dedicated connector or via Control/ Status Bus.

RESPONSE: The requirement was reviewed and is correct as written in the specification. The specification states that a connector may be used.

3.18.1 COMMENT: Should the actual MTBF data be specified on a rotary wing platform even though it will be collected on the fixed wing Shadow? Specify actual MTBF under UAS conditions.

RESPONSE: The USA and USN do not have a defined MTBF value for UAV conditions. During a Government review, it was determined that the rotary wing conditions most closely matched the Shadow requirements.

The specification was edited to further clarify the requirements as follows:

3.18.1. Mean Time between Failures (MTBF).

The transponder excluding the appliqué, shall have an MTBF of 2,000 hours under Airborne Rotary Wing (ARW) conditions.

3.18.5 COMMENT: Suggest changing requirement to not specify control/status bus for elapse time accessibility.

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RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.18.5.1 COMMENT: Please clarify “non-resettable” with regards to ET. Can it require a password for reset?

RESPONSE: The requirement was reviewed and is correct as written in the specification. There shall be no method for resetting the memory, with password or otherwise.

- 3.20.1 COMMENT: Suggest elimination of the "at the transponder" requirement for fault indication and allow for fault indication at the control/ status bus

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.20.3 COMMENT: Suggest changing requirement to not specify control/status bus for fault isolation information.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.21.2.2. COMMENT: Does this requirement refer to testing of the individual Gillham Altitude inputs or altitude source selection inputs that are not in Table 3?

RESPONSE: Altitude source is confirmed by J1-20 input, Altitude Source. The input is defined in Table 3.

COMMENT: Must the altitude source be tested during PUBIT, or could continuous monitoring the altitude inputs start after PUBIT is complete (see para. 3.11.9.5)?

RESPONSE: Altitude Source is available and required by Table 3, input J1-20. As written in the specification, the Continuous Monitor BIT shall monitor the Altitude Source input, and the other inputs listed in the specification.

- 3.21.3.1 COMMENT: Recommend the fault detection performance requirement match existing fielded unit performance of the APX-119, which is 92% to ensure a cost effective BIT implementation.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.21.3.2 COMMENT: Recommend requirement for the single SRA fault isolation match existing fielded unit performance of the APX-119, which is 65%, to ensure a cost effective BIT implementation.

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RESPONSE: The requirement was reviewed and is correct as stated in the specification.

- 3.21.3.3 COMMENT: Recommend requirement for three SRA fault isolation match existing fielded unit performance of the APX-119, which is 96%, to ensure a cost effective BIT implementation

RESPONSE: The requirement was reviewed and is correct as stated in the specification.

- 3.21.3.5 COMMENT: Suggest changing requirement to not specify "indicators present at the transponder." (i.e. just "available to maintenance personnel")

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.21.3.7 COMMENT: What are the "fault record messages?" Clarify requirement.

RESPONSE: The specification was edited to further clarify the requirements as follows:

3.20.2.1. Fault Records.

The transponder shall maintain a minimum of the last 50 BIT/fault records in non volatile memory. These records shall be accessible at the organization level.

3.21.1. BIT/Fault Log.

(SECTION HAS BEEN DELETED)

- 3.21.3.8 COMMENT: Does a crypto fault if keys are erased or expired, since the crypto is not "broken?" Allow key erased/ expired info separate from crypto fault info.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.21.3.10 COMMENT: If the SFF demonstrates full performance under all environmental conditions, thermal monitoring should not be necessary. Make requirement optional.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.23.3.12 COMMENT: Is this a platform requirement? Remove requirement if it does not apply to the SFF.

RESPONSE: The requirement was reviewed and removed from the specification.

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3.23.3.13 COMMENT: Is this a platform requirement? Remove requirement if it does not apply to the SFF.

RESPONSE: The requirement was reviewed and removed from the specification.

3.24.1 COMMENT: Requirement states no shielding while AQP requires aircraft representative cabling. Suggest replacing "standard unshielded cabling" with "aircraft representative cabling".

RESPONSE: The specification was edited to further clarify the requirements as follows:

Electromagnetic Interference Requirements shall be met while using aircraft representative cabling on external unit interfaces.

3.24.2 COMMENT: Requirement subjects the transponder to 100V spikes. Is this a US Army Shadow requirement? Please clarify requirement.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

3.24.3 COMMENT: SFF requires RS103 test levels and modulation per para 3.2.4 of ADS-37A-PRF which AM, FM, & pulse modulation requirements at levels up to 21,279V/m. AQP says can limit levels to 200V/m. Which document takes precedence? Consider stating order of precedence for Performance Specification, AQP and ADS-37A-PRF.

RESPONSE: The specification was edited to further clarify the requirements as follows:

All components and subsystems of the transponder shall meet the applicable requirements of MIL-STD-461F as shown in Table 4 of this specification and as specified herein. The maximum test level shall be limited to 200 V/m RMS.

3.24.4 COMMENT: What is meant by "worst case conditions?" Consider replacing with "Army Limits"

RESPONSE: Worst Case Conditions are defined in the referenced standard, MIL-STD-461F.

3.24.5 COMMENT: Believe the requirement is incorrect. "The equipment shall not generate spikes (transients of duration less than 50  $\mu$  s)...", should be: "Spikes are defined as transients of duration less than 50  $\mu$  s..." Correct requirement.

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RESPONSE: The specification was edited to further clarify the requirements as follows:

The equipment shall not generate spikes when measured from the base of the transient on input power lines. Spikes shall be defined as transients with duration of less than 50  $\mu$ s.

- 3.28.2.3 COMMENT: Requirement calls out Fixed Wing, Propeller (Cat13) and Rotary Wing (Cat 14) vibration profiles. Suggest limiting vibration test to Fixed Wing, Propeller (Cat13) to be consistent with US Army Shadow environment.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

- 3.28.2.4 COMMENT: This is not called out as a requirement in the AQP. Delete rapid decompression requirement

RESPONSE: The requirement was reviewed and removed from the specification.

- 3.28.2.9 COMMENT: Specified altitude, 35Kft, is in conflict with AQP para. 6.1.13, 25kft. Modify requirement to 25Kft which is consistent with AQP and Shadow service ceiling.

RESPONSE: The specification was edited to further clarify the requirement as follows:

The transponder shall sustain no physical damage and operate without degradation during and subsequent exposure at the altitude of 25,000 feet IAW MIL-STD-810G, Method 520.3, Procedure III (Temperature/Altitude/Humidity Test, excluding vibration) for a minimum of 10 cycles per 6.1.13 of the AQP.

- 3.28.2.11 COMMENT: 1. Revise the requirement to be consistent with the low temperature performance limits of most commercially available electronic components, -40C.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

COMMENT: 2. The requirement is inconsistent with the Temp/Alt/Humid/Vib rqmt of the AQP, para. 6.1.13 which only requires operational testing "...after exposure to temperatures ranging from -54C to +71C." Modify requirement to test operational performance at -40C.

RESPONSE: The requirement was reviewed and is correct as written in the specification.

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3.28.2.20 COMMENT: Requires bench handling shock. AQP requires only when max dimension is greater than approx 9 inches. Clarify requirement.

RESPONSE: The requirement was reviewed and removed from the specification.

COMMENT: Will the Government provide KIV-77 or KIV-78 Cryptographic Cards to potential offerors prior to the award of the Small Form Factor production contract?

RESPONSE: The NAVAIR SFF Procuring Contracting Officer (PCO) is unable to provide COMSEC equipment to potential offerors prior to award of the SFF contract. Potential offerors who desire such equipment may either request it as GFE under an existing contract with the Government or they can attempt to buy the equipment from another defense contractor.

Offerors who currently have a contract with the U.S. Government may be able to obtain COMSEC equipment as Government Furnished Equipment (GFE) under their contract for use in SFF proposal preparation efforts if they possess the appropriate authorizations pursuant to FAR Part 45. Offerors in that position would need to request the COMSEC GFE from the PCO for their contract. **NAVAIR will not be responsible for facilitating the offeror's request nor will NAVAIR ensure that the COMSEC equipment is provided in a timely fashion.** It is a matter of property administration under the existing contract. The Government disclaims liability for late delivery of GFE for contractor purposes in such circumstances. In addition, Offerors are advised that the NAVAIR PCO will **not** alter the SFF procurement schedule as a result of another Government PCO's failure to provide COMSEC equipment to the affected Offeror.

Potential offerors may contact the following Industry personnel to request direct purchases of KIV-77 or KIV-78 Cryptographic Cards:

KIV-77 Cryptographic Cards:

Mr. Joseph J. Loiodice

Raytheon Network Centric

Office Phone: (443) 558-5310

E-Mail Address: [Joseph\\_J\\_Loiodice@raytheon.com](mailto:Joseph_J_Loiodice@raytheon.com)

KIV-78 Cryptographic Cards:

Mr. Fiore Zuena

General Dynamics C4 Systems

Office Phone: (480) 675-1075

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E-Mail Address: [Fiore.Zuena@gdc4s.com](mailto:Fiore.Zuena@gdc4s.com)

NAVAIR will **not** be responsible for facilitating the offeror's request to the points of contact noted above. **NAVAIR has no authority to direct the points of contact listed above to sell KIV-77 and/or KIV-78 Cryptographic Cards to potential SFF Offerors or to influence the terms of any such sale to include pricing and/or delivery dates.** Offerors are advised that the NAVAIR PCO will **not** alter the SFF procurement schedule as a result of the failure of these points of contact to provide COMSEC equipment to the affected Offeror.

COMMENT: Based on the CLIN Structure are we to assume that the crypto is GFE?

RESPONSE: The Government will furnish crypto units once contract is awarded.

COMMENT: Clarification of Platform Connectors

Table 2 of MIL-PRF-SFF provides the requirements for the Transponder Interface Connector. There is some confusion with the part numbers. The part numbers for J3 & J4 ("3184-2240-00") seems to call out the transponder side connectors. The part numbers for J1 & J2 seem to call out the *aircraft* side connectors (the "P 1" and "P2" mates to standard IFF transponder connectors). Please confirm which side of the interface the part numbers as described in the spec are used on.

RESPONSE: The specification was edited with corrected part numbers.

COMMENT: 1553 possible error on pin-out

In the SFF Specification, Table 3 identifies the required J1 pin configuration. In this table, J1-10 thru J1-16 are defined as the electrical connection for the MIL-STD-1553b signals. In comparing to known APX-100 configurations, there is some confusion in Table 3. Both J1-10 and J1-16 have identical message names and definitions.

RESPONSE: Table 3, J1-10 through J1-16 of the specification has been edited to reflect these changes.

COMMENT: Clarification on 48 hour TOD Stale vs. standard requirement of 96 hours [Ref: MIL-PRF-SFF par. 3.9.6]

The specifications for each of the 04-900 compatible crypto devices supports a time accuracy within required limits for at least 96 hours. The 48 hour stale time limit is inconsistent with other IFF equipment and may lead to confusion with operators who are familiar with other IFF equipment. Please confirm that the 48 hour requirement is correct.

RESPONSE: The TOD stale varies per crypto device. The specification was edited to state a minimum of 48 hours.

COMMENT: Clarification on 50 fault records vs. fault logs.

MIL-STD-SFF par. 3.20.2.1 states that the transponder shall maintain at least 50 fault records. Par. 3.21.1 states that the transponder shall store at least the first 5 and last 5 BIT/Fault logs. It is not clear what the difference is between "Fault Records" and "Fault Logs". The recording of Fault log data above 10

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(first 5 and last 5) may actually be more confusing for maintainers and depot personnel. Please clarify the requirement.

RESPONSE: The specification was edited to further clarify the requirements as follows:

3.20.2.1. Fault Records.

The transponder shall maintain a minimum of the last 50 BIT/fault records in non volatile memory. These records shall be accessible at the organization level.

3.21.1. BIT/Fault Log.

(SECTION HAS BEEN DELETED)

COMMENT: Documentation request to support fit check

In order to correctly evaluate the requirements of the Shadow Fit Check, please provide the following documents:

Drawings of the installation volume (these can be PDFs)

Description of volume available for interface features such as connectors, mating connectors, front mounting adapters, rear mounting lip, crypto fill connector/cable, etc

Drawings of the installation details (these can be PDFs). These should include

Rear mounting flange detail that captures the Transponder rear lip (including tolerances)

Front mounting feature (currently the Shadow transponder utilizes a front "L" bracket to replace each front mounting hook. This "L" bracket is then bolted directly to the platform interface surface)

STEP or IGES files of the installation volume and installation details. Detailed solid models

RESPONSE: Detailed drawings are not available. However, images will be released of the compartment.