Missile Warning System

System Requirement Specification

Index.

History

Date	Description	Name	Version
17-09-2010	Initial document	kpi	1
18-09-2010	Format requirements to heading 1	kpi	2
23-9-2010	Strukture from SSS-DID put in. Paragraph 3.8, 3.9 and 3.12 is updated.	LMU	3
24-9-2010	Update and release for SRR	AHP	A

1. Scope

1.1 Identification

This document describes a self protection suite for the F-16 combat aircraft used by the Royal Danish Air Force. The protection suite incorporates a pod for mounting under the left wing and an intelligent cockpit control unit for controlling the system. In the pod is mounted a Missile Warning System (MWS) which gives input to the cockpit control unit. The cockpit control unit controls the dispensing of flares and chaffs from the pod. The solution shall provide warning upon detection of missile threats and be able to automatically dispense payloads in response.

The MWS will be provided as Government Furnished Equipment (GFE) and be physically installed by Company F.

1.2 System overview

The system is a self protection suite for a F-16 combat aircraft , it shall protect the aircraft against missile attacks. The system consists of 2 main systems:

- Cockpit Unit, which communicate with the systems in the POD and Aircraft Mission Computer. Has also an interface to the aircraft intercom system and an interface for the user to control the system.

- POD, which holds magazines for flares and chaffs and what is needed for firing them of, plus the MWS system.
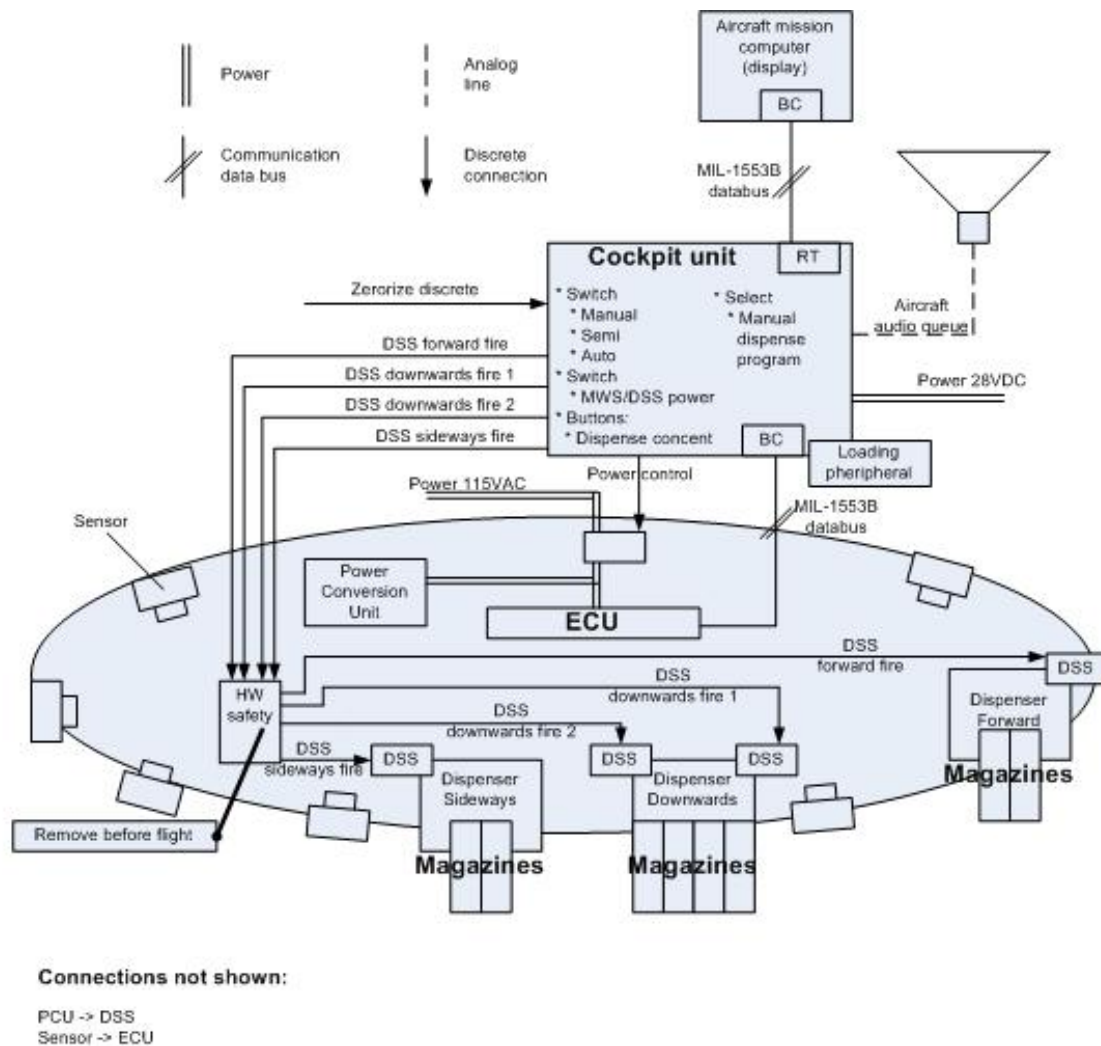
Figure 1

Missiles shall be detected by the MWS that are provided as a GFE equipment and mounted by Company F. When missile attacks are detected information is sent to the cockpit control unit, which depending on the mode it is in will react on the information and is able to react by dispensing flares and chaffs according to the program chosen. By the interface to the aircraft intercom system audio cues and warnings can be provided.

The system has a number of different users depending on what is done and where:

- On ground the system can be maintained by technicians that update SW and control the system

- Ground personnel shall be able to mount it and, when ready for takeoff, arm it.

- The pilot shall use the system, by choosing an appropriate program and depending on program chosen, consent dispense when missile attacks are detected.

- After dispensing has happened maintenance has to be done again to fill up the magazines again with flares and chaffs.

1.3 Document overview

This document shall describe all the Systems Requirements for the Self Protection System for the F-16 combat aircraft and the development of the system shall be based on this document, when the system fulfil the requirements in this document the requirement of the Royal Danish Air Force is fulfilled.

This document must only be used in the project group by Company F and project group and other personal at The Royal Danish Air force that are cleared to have access to this project.

2. Referenced documents

2.1 Input to requirements

ID	Name	Description
TC1	Terma case.pdf	Document received from TERMA at IHA 3/9 2010
TCC1	Terma case comments v1.pdf	
TCM1	Terma case meeting 17 9 2010 at IHA v1.pdf	
TCQA1	Terma case questions and answers v1.pdf Answers received at consultation meeting at IHA 17/9 2010 room 517.	

2.2 Standards

Standard	Description
DM30p	NATO dispenser magazine type contains the complete details about the magazines physical constructions and interface,
FP42f	MIL standard 1600-2-9 v12.45 - F-16 POD standard contains complete specification about requirements for POD manufacturing, including size, weight, material, shape, etc.
FE16d	F-16 EW standard contains the requirements and test procedures required to have a new system approved on an F-16.
PM11b	F-16 POD mounting standard includes specifications on how a POD shall safely be mounted to an F-16 aircraft.
DF14b	NATO dispenser threat format specify the protocol to use when exchanging threat data with the F-16 aircraft mission computer.
GFE	The complete specification of the Government Furnished Equipment that is the MWS.
FBIT12c	F-16 subsystem BIT standard indicate how a subsystem shall test its internal status to comply with the F-16 operational standard.
ACTv2	Separate document excluded due to the fact that it is not important for the process.
AMM32f	Aircraft maintenance manual contains details about how removable parts on aircraft shall be located and labeled.
SDS23v	DOD sensitive data standard specify how sensitive data must be stored, and also how the decryption key must be stored.
DWS12g	DOD data wipe specification dictates how sensitive data must be wiped from different media.
MIL-1553B	Military standard for a redundant communication protocol. The MIL-1553B is pure

	master-slave(s), and can have 1 Bus Controller (BC) and a number of Remote Terminals (RT). Only the BC can initiate communication, so if two RTs are to communicate it must be programmed into the BC. The MIL-1553B specify polling frequencies of up to 50Hz, meaning that a given package (e.g. status information) can be requested (and thereby sent) with a minimum interval of 20ms.
FAII34g	F-16 Audio Interface for Intercom

3. Requirements.

3.1 Required states and modes.

REQ ID	Requirement
SR-1	The system shall be able to work in 2 different System states: Armed and Disarmed. INFO: Armed: In this state the system is able to react on information from the MWS system and depending on which mode it is set to by the pilot (Manuel, Semi automatic or automatic from UR 12) it will react according to the mode. But for security reasons there shall also be a "plane on ground" mode, where firing of chaffs and flares are disabled. (Figure 2) INFO: Disarmed: in this state it shall be impossible to fire flares or chaffs even though the MWS system of any reason gives a warning against missile attack. In this state shall it also be possible to update SW in the MWS. (se figure ???1)
SR-2	The system state shall power up as Disarmed
SR-3	The System state Shall change from Disarmed to Armed when all of the following conditions are met (AND'ED): 1. The Safety pin is to be removed before flight. 2. The plane is not on ground
SR-4	The System state Shall change from Armed to Disarmed when one of the following conditions are met(OR'ED): 1. The Safety pin is inserted after flight. 2. The plane is off ground.
SR-5	In System state Armed the behavior of the Thread response subsystem shall be influenced by the mode (Manuel, Semi automatic, Automatic or Plane on Ground)
SR-6	Changing between the modes: Manuel, Semi automatic or Automatic shall be chosen by the position of a selector switch in the cockpit.
SR-7	Changing mode to "Plane on Ground" from any state of Manual, Semi automatic or Automatic shall happen when the plane is on ground.
SR-8	Changing mode from "Plane on Ground" to any state of Manual, Semi automatic or Automatic shall happen when the plane is off ground and the safety pin is removed. The mode shall be chosen by the position of a selector switch in the cockpit.
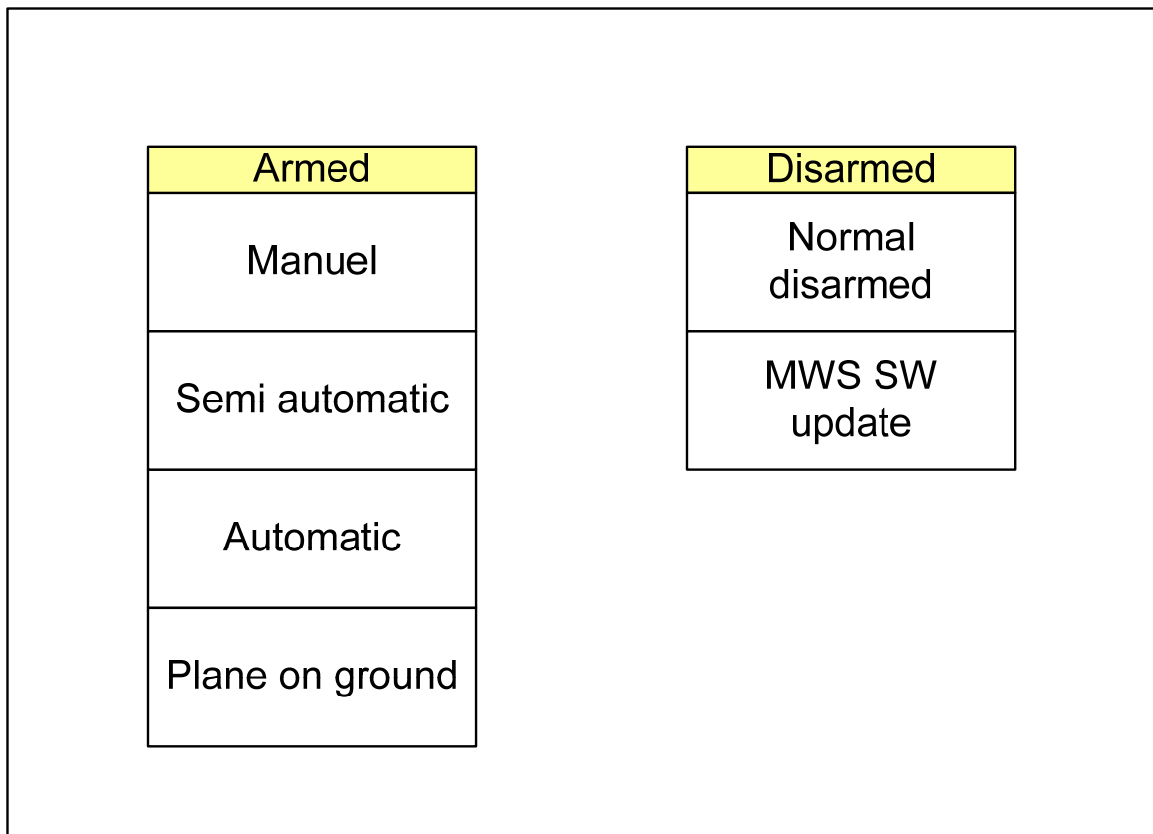
Figure 2

3.2   System capability requirements.

3.2.1 Engaging / Disengaging The System

REQ ID	Requirement
SR-9	Controlling power on/off, for the dispensing system and the MWS shall be done by a secured switch Mil.Grade.xyz inside the cockpit.
SR-10	When turning on power a maximum of 5 seconds will last before the system is fully operational.
SR-11	When turning off power a maximum of 2 seconds will last before the system is fully closed down.

3.2.2 Threat detection

The system will detect a threat using the MWS, compare this to already known threat patterns and act accordingly with respect to system states.

REQ ID	Requirement
SR-12	The Threat Response Subsystem shall be able to store 100 Threat patterns

INFO : A thread pattern is a certain number of threads attacking the aircraft from certain angles. |
SR-13	All data concerning the Threat patterns shall be handled by the winXYZapplication. This includes programming configuration uploading or downloading to the Threat response system.
SR-14	When the Threat Response Subsystem automatically chooses a countermeasure program, it shall be done by matching the stored Thread patterns with the actual threat pattern and finding the best match using the mathematical zyx procedure.
SR-15	All data concerning the mathematical zyx procedure shall be handled by the winXYZapplication. This includes programming configuration uploading or downloading to the Threat response system.
SR-16	When the AMC receives information about threats that are detected by the MWS, the kind of threat and the direction (body frame format) shall be displayed in the cockpit within 20 milliseconds from AMC is receiving the threat info.
SR-17	When the AMC receives information about threats that are detected by the MWS, the cockpit unit shall play an audio cue on the aircrafts audio system.
SR-18	When a threat is detected the Audio Cue System shall be signalled to start within 20 milliseconds from AMC is receiving the threat info.
SR-19	The audio cue played in case of a threat shall be an indication of threat type (e.g. "Missile"), location (e.g. "4 o'clock") and elevation (e.g. "low"), as specified by the audio queue table *ACTv2*.
SR-20	When the Threat Response Subsystem is in the manual mode, the threads shall be heard and seen by the pilot but he himself must manually select and execute a Countermeasure program.
SR-21	The cockpit unit shall include a consent button to use with semi-automatic dispensing.
SR-22	The cockpit unit shall display the LRU status received from the POD as indicated by the LRU status display specification.
SR-23	When the Threat Response Subsystem is in the Semiautomatic mode a countermeasure program shall be chosen by the system and executed but only upon consent from the pilot.
SR-24	When the Threat Response Subsystem is in the Automatic mode a countermeasure program shall be chosen by the system and executed.

3.2.3 Other functional requirements

REQ ID	Requirement
SR-25	The systems shall comply with all F-16 EW standards for EMC and data bus load as specified by the F-16 EW standard *FE16d*.

3.2.3.1 CCU

REQ ID	Requirement
SR-26	The cockpit unit shall perform an internal built-in test of its internal subsystems and HW, as specified by the F-16 subsystem BIT standard *FBIT12c*.
SR-27	The cockpit unit shall request status information from the ECU every 20ms.

3.2.3.2 POD

REQ ID	Requirement
SR-33	The POD shall contain three dispenser magazine mounts. INFO: These shall henceforth be named first, second and third.
SR-34	The POD's first dispenser magazine mount shall physically be located before the second and third dispenser magazine mount relative to the nose of the plane.
SR-35	The POD's first dispenser magazine mount shall support forward dispensing.
SR-36	The POD's first dispenser magazine mount shall support two magazines.
SR37	The POD's second dispenser magazine mount shall physically be located before the third dispenser magazine mount relative to the nose of the plane.
SR-38	The POD's second dispenser magazine mount shall support leftwards dispensing.
SR-39	The POD's second dispenser magazine mount shall support four magazines.
SR-40	The POD's third dispenser magazine mount shall support downwards dispensing.
SR-41	The POD's third dispenser magazine mount shall support two magazines.
SR-42	The POD shall comply with all F-16 requirements for aerodynamics and radar reflections as specified by the F-16 POD standard *FP42f*.
SR-44	The ECU shall perform the built in test that is supported by this Government Furnished Equipment (*GFE*).
SR-45	The ECU shall report the status information available for this Government Furnished Equipment (*GFE*).
SR-46	The POD shall supply the status of the following LRUs: • The Sensors • The ECU INFO: The Magazines and DSS are not seen as LRUs and also do not have status reporting capabilities. INFO: It is assumed that the ECU has the ability to deliver this information.
SR-47	The status reported by the POD as a whole shall be: 1. POD internal temperature 2. ECU operational status (OK, ERROR) INFO: It is assumed that the ECU has the ability to deliver this information. INFO: It is assumed that the ECU has a temperature sensor inside the POD and is able to deliver its reading on the data bus.

3.2.4 Performance requirements

CCU

REQ ID	Requirement
SR-48	The cockpit unit shall forward the threat data received from the MWS within 20ms.
SR-49	The cockpit unit shall request the performance of a built in test by the ECU every 15 minutes.

SR-50	The cockpit unit shall forward the built in test results to the aircraft mission computer with a maximum latency of 1 second from receiving the results.
SR-51	The cockpit unit shall forward the status of the individual subsystems and LRUs; ECU, POD and aircraft unit to the aircraft mission computer with a maximum latency of 100ms from receiving the information. INFO: The Magazines and DSS are not seen as LRUs and also do not have status reporting capabilities.
SR-52	When the erasing of sensitive data procedure is initiated, the cockpit unit shall erase its sensitive data decryption key within 100ms.
SR-53	The system shall be able to dispense two payloads in a maximum of 40ms

3.3 System external interface requirements.

This paragraph defines the requirements on the interfaces between the system and externals parts.

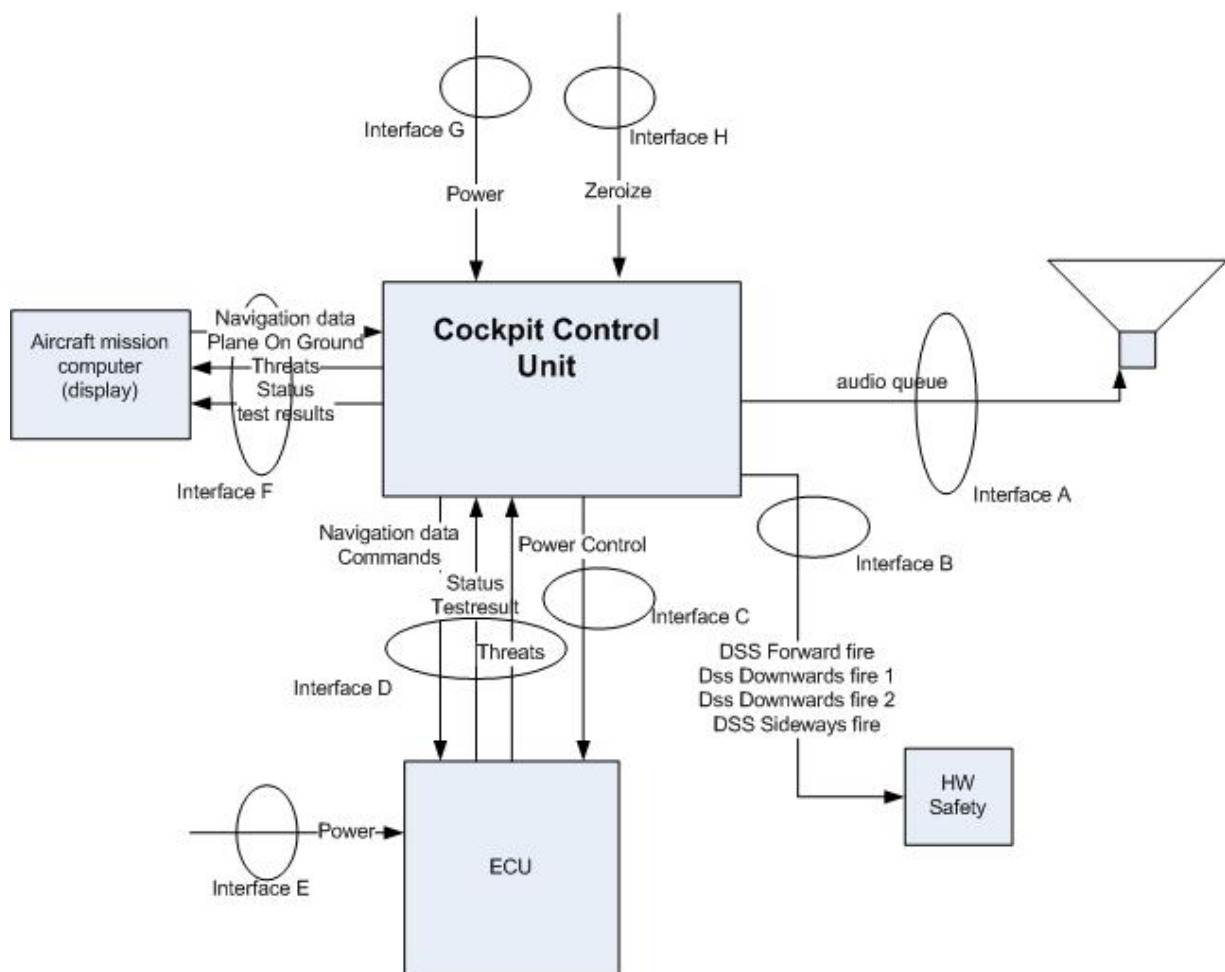### 3.3.1 Interface identification and diagrams.

Figure 3 - Interface A, E, F G and H are interfaces to external parts/systems.

3.3.2 Interface A (Cockpit Control Unit to Intercom).

REQ ID	Requirement
	The Cockpit Control Unit shall interface the aircraft intercom system according to audio interface for intercom in the F16: FAII-34G.

3.3.3 Interface E (Power to Power Switch in pod).

To be able to control the power to the pod a controllable power switch in the pod I needed. Power from the supply in the wing is connected to this power switch and not as indicated to the ECU.

3.3.4 Interface F (Cockpit Control Unit to Aircraft Mission Computer).

This interface shall make it possible to communicate with the AMC. Information will both be from AMC to the system and from the system to the AMC.

REQ ID	Requirement
SR-54	The cockpit unit shall communicate with the aircraft mission computer via the planes main MIL-1553B data bus.
SR-55	The cockpit unit shall forward all threat data received from the MWS to the aircraft mission computer in body frame format.
SR-56	The cockpit unit shall use the NATO threat format *DF14b* to forward threat data to the aircraft mission computer.

3.3.5 Interface G (Power to Cockpit Control Unit).

The Cockpit Control Unit will be supplied with 28VDC from the aircraft.

3.3.6 Interface H (Zeroize to Cockpit Control Unit).

The Cockpit Control Unit will be given a discrete signal from aircraft.

REQ ID	Requirement
SR-57	The cockpit unit shall receive an input discrete which when set to logic 1 shall trigger the erasing of sensitive data procedure.

3.4   System internal interface requirements.

Interface B, C and D on figure 3 is defined to be internal interfaces.

3.4.1 Interface B (Cockpit Control Unit to Safety Switch).

This interface is used to give the signals to the four DSS's via a discrete signals.

3.4.2 Interface C (Cockpit Control Unit to Power Switch in pod).

To control the power in the pod there is a controllable power switch in the pod. Through interface C this control signal is feed from Cockpit Control Unit to the power switch.

3.4.3 Interface D (Cockpit Control Unit to ECU).

This interface is used for the communication between the Cockpit Control Unit and ECU.

REQ ID	Requirement
SR-58	The ECU shall communicate with the cockpit unit via a dedicated *MIL-1553B* data bus.
SR-59	The ECU shall forward threat data to the cockpit unit in NATO dispenser threat format *DF14b*.
SR-60	The POD LRU status shall be reported in the POD status format specified under interfaces. INFO: This interface is specified by the ECU (GFE).

3.5   System internal data requirements.

Intentionally left blank

3.6   Adaptation requirements.

Intentionally left blank

3.7   Safety requirements.

REQ ID	Requirement
SR-61	The POD shall include a safety pin that prevents the dispenser from firing.
SR-62	The POD safety pin shall be clearly labelled and accessible by aircraft maintenance crew as specified by the aircraft maintenance manual *AMM32f*.

3.8   Security and privacy requirements.

REQ ID	Requirement
SR-63	The system shall be able to erase sensitive data upon input from a discrete signal from aircraft.
SR-64	The cockpit unit shall keep all sensitive data in an encrypted format as specified by the DOD sensitive data standard SDS23v
SR-65	cockpit unit shall erase the decryption key using the DOD data wipe specification DWS12g.
SR-66	When the erasing of sensitive data procedure is initiated, the cockpit unit shall erase its sensitive data decryption key within 100ms

3.9   System environment requirements.

This paragraph shall specify the environment in which the system must operate.

3.9.1 Temperature.

REQ ID	Requirement
SR-67	The pod structure shall be operational at temperatures of 95°C on the outer skin and of 102°C on the leading edge for 25 minutes.
SR-68	The pod structure shall be operational at temperatures of 134°C on the outer skin and

	of 151°C on the leading edge for 3 minutes.
SR-69	The maximum temperature inside the pod shall not be more than 70°C during and test and under normal operation.

3.9.2 Acceleration

REQ ID	Requirement
SR-70	The pod structure shall be without any failures after being exposed to a steady state acceleration of 5g fore.
SR-71	The pod structure shall be without any failures after being exposed to a steady state acceleration of 2.5g aft.
SR-72	The pod structure shall be without any failures after being exposed to a steady state acceleration of 25g up
SR-73	The pod structure shall be without any failures after being exposed to a steady state acceleration of 11g down.

3.10 Computer resource requirements.

Intentionally left blank

3.11 System quality factors.

Intentionally left blank

3.12 Design and construction constraints.

3.12.1 Weight

REQ ID	Requirement
SR-74	The total weight of POD shall not exceed 270 kg.
SR-75	The POD shall be able to support an 18.2kg MWS

3.12.2 Mounting

REQ ID	Requirement
SR-76	The pod shall be mounted on the aircraft wing with standard T-hooks spaced by 13 inches.
SR-77	The pod shall be mounted on the left-hand wing.
SR-78	The POD shall support standard NATO dispenser magazines type DM30p.

3.12.3 MWS

REQ ID	Requirement
SR-79	MWS shall be provided as a Government Furnished Equipment.
SR-80	MWS shall physically be mounted by Company F.

3.12.4 Power

REQ ID	Requirement
SR-81	The cockpit control unit shall support 28VDC supply voltage.
SR-82	Power consumption of the pod shall not exceed 700W.
SR-83	The POD shall be able to run on 115VAC 400Hz.
SR-84	The system shall be able to supply the GEF (MWS) with maximum 85W from a 28VDC power source and a maximum of 100W from an 115VAC 400Hz power source.
SR-85	The system shall be able to supply power required to ignite a payload (126W) for a period of up to 20ms.

3.12.5 Coverage against missile threats.

REQ ID	Requirement
SR-86	The six sensors shall be located to cover all angles which are not shaded by the aircraft.

3.13 Personnel-related requirements.
Intentionally left blank

3.14 Training-related requirements.
Intentionally left blank

3.15 Logistics-related requirements.
Intentionally left blank

3.16 Other requirements.
Intentionally left blank

3.17 Packaging requirements.
Intentionally left blank

3.18 Precedence and criticality of requirements.
Intentionally left blank

4. Qualification provisions.

REQ ID	Test description	Qualification method
SR-33	Inspect that the requested dispenser mounts are located on the POD	Inspection
SR-34	Inspect that the first dispenser mount is mounted correctly on the POD.	Inspection
SR-35	Inspect that the first dispenser mount is placed correctly on the POD.	Inspection
SR-36	Inspect that the first dispenser mount can hold 2 magazines.	Inspection
SR-37	Inspect that the second dispenser mount is placed correctly on the POD.	Inspection
SR-38	Inspect that the second dispenser mount is placed correctly on the POD.	Inspection

SR-39	Inspect that the second dispenser mount can hold 4 magazines.	Inspection
SR-40	Inspect that the third dispenser mount is placed correctly on the POD.	Inspection
SR-41	Inspect that the third dispenser mount can hold 2 magazines.	Inspection
SR-78	Inspect that the dispenser mounts support the correct magazine type.	Inspection
SR-42	The POD design and implementation must be verified by a certified third party F-16 POD certifying authority.	Inspection and verification
SR-47	The POD design and implementation must be verified by a certified third party F-16 EW certifying authority.	Inspection and verification
SR-43	Inspect that the POD is mounted correctly.	Inspection
SR-54	Inspect that the POD is mounted correctly.	Inspection
SR-55	Inspect the code and run simulation with a MWS simulator to verify the inertial format to body-frame format conversion.	Code inspection and test
SR-48	Run simulation with a MWS simulator to verify the delay from cockpit unit reception to availability on aircraft mission bus. A simulator of the aircraft mission bus must be set up to poll the cockpit unit as fast as possible.	Test
SR-56	Inspect the code and run simulation with a MWS simulator to verify the threat data format.	Code inspection and test
SR-58	Inspect that the MWS uses a dedicated MIL-1553B data bus.	Inspection
SR-59	Inspect the code and run simulation with a MWS simulator to verify the threat data format.	Code inspection and test
SR-49	Run simulation with a MWS simulator to verify the BIT request interval.	Test
SR-44	Inspect that the supported BIT is requested and run simulation with a MWS simulator to verify the BIT responses.	Code inspection and test
SR-28	Inspect the internal BIT code and run test with test setup (faulty HW) to verify BIT responses.	Code inspection and test
SR-50	Run simulation with a MWS simulator to verify the maximum delay. A simulator of the aircraft mission bus must be set up to poll the cockpit unit as fast as possible.	Test
SR-29	Inspect the status request code time and run test with MWS simulator to verify status request interval.	Code inspection and test
SR-45	Verify that all available status information is placed on the MWS to cockpit unit data bus.	Test
SR-51	Run simulation with a MWS simulator to verify the maximum delay. A simulator of the aircraft mission bus must be set up to poll the cockpit unit as fast as possible.	Test
SR-18	Run simulation with a MWS simulator to verify an audio cue is played.	Test
SR-19	Run simulation with a MWS simulator to verify the correct audio cues are played.	Test
SR-61	Verify that a removable pin exists and that firing is disabled when the pin is present in the POD.	Inspection and test
SR-62	Verify pin design according to standard	Inspection
SR-57	Verify that zerorize button is present on cockpit unit.	Inspection
SR-31	Verify the DOD standard is met with respect to sensitive data storage.	Code inspection
SR-32	Verify the DOD standard is met with respect to decryption key erase.	Code inspection
SR-52	Show that it is probable that the key will be wiped within 100ms.	Code inspection
SR-46	Verify with MWS simulator that the required status is available and correct.	Test
SR-47	Verify with MWS simulator that the required status is available and	Test

		correct.	
SR-53	Verify by measuring the total time for dispensing two payloads as fast as possible that the two payloads are dispensed within 40ms.	Test	
SR-1	Controlling power on/off, for the dispensing system and the MWS shall be done by a secured switch Mil.Grade.xyz inside the cockpit	Observe that the power led in the MWS is turned on and off by controlling the switch in the cockpit	
SR-2	When turning on power a maximum of 5 seconds will last before the system is fully operational	Using an oscilloscope and checking the delay from turning on the switch to the "operational led" is on	
SR-3	When turning off power a maximum of 2 seconds will last before the system is fully closed down	Using an oscilloscope and checking the delay from turning off the switch to the "operational led" is off	
SR-16	When the AMC receives information about threats that are detected by the MWS, the kind of threat and the direction (body frame format) shall be displayed in the cockpit ,(within 20 milliseconds from AMC is receiving threat info)	Tested on status LEDs. On AMC and MWS using the threadsimulation.	
SR-6	The Threat Response Subsystem shall be in one of three modes : Manual, Semiautomatic, Automatic. The mode shall be chosen by the position of a selector switch	Test that the status LED's reflect the setting of the appropriate selector switch	
SR-20	When the Threat Response Subsystem is in the manual mode, the threads shall be heard and seen by the pilot but he himself must select and execute a Countermeasure program	Tested by using the Threat simulator mode	

		of the MWS
SR-23	When the Threat Response Subsystem is in the Semiautomatic mode a countermeasure program shall be chosen by the system and executed but only upon consent from the pilot	Tested by using the Threat simulator mode of the MWS
SR-24	When the Threat Response Subsystem is in the Automatic mode a countermeasure program shall be chosen by the system and executed	Tested by using the Threat simulator mode of the MWS
SR-1	The Threat Response Subsystem shall be able to store 100 Threat patterns	Tested by using the winXYZapplication to write and read 100 Threadpatterns, and afterwards check by comparision to the originals
SR-14	When the Threat Response Subsystem chooses a countermeasure program, it shall be done by matching the stored Thread patterns with the actual threat pattern and finding the best match using the mathematical zyx procedure.	Tested by using the Threat simulator mode of the MWS

5. Requirements traceability.

All Trace Ids refer to the document TC1

REQ ID	Trace ID	Reference
SR-1	UR-8	
SR-2	UR-8 indirect	
SR-3	UR-8 indirect	
SR-4	UR-8 indirect	
SR-5	UR-12	
SR-6	UR-12 indirect	
SR-7	UR-12 indirect	
SR-8	UR-12 indirect	
SR-9	UR-11	
SR-10	UR-11 indirect	

SR-11	UR-11 Indirect	
SR-12	UR-21	
SR-12	UR-12	
SR-13	UR-21	
SR-14	UR-15	
SR-15	UR-16	
SR-16	UR-10	
SR-17	UR-7	
SR-18	UR-7	
SR-19	UR-7	
SR-20	UR-13	
SR-21	UR-14	
SR-22	UR-7	
SR-23	UR-14	
SR-24	UR-15	
SR-25	UR-3	
SR-27	UR-6	
SR-33	UR-2	
SR-34	UR-2	
SR-35	UR-2	
SR-36	UR-1	
SR-37	UR-2	
SR-38	UR-2	
SR-39	UR-1	
SR-40	UR-2	
SR-41	UR-1	
SR-42	UR-3	
SR-43	UR-4	
SR-44	UR-6	
SR-45	UR-6	
SR-46	UR-10	
SR-47	UR-3	
SR-48	UR-5	
SR-49	UR-6	
SR-50	UR-6	
SR-51	UR-6	
SR-52	UR-9	

SR-53	UR-20	
SR-54	UR-40	
SR-55	UR-5	
SR-56	UR-5	
SR-58	UR-40	
SR-59	UR-5	
SR-60	UR-10	
SR-61	UR-8	
SR-62	UR-8	
SR-63	UR-9	
SR-64	UR-9	
SR-65	UR-9	
SR-66	UR-9	
SR-67	UR-32	
SR-68	UR-33	
SR-69		The MWS operating maximum temperature is 70°C.
SR-70	UR-30	
SR-71	UR-30	
SR-72	UR-30	
SR-73	UR-30	
SR-74	UR-31	
SR-75		The MWS including ECU and six sensors weighs 18,2 kg.
SR-76	UR-42	
SR-77	UR-4	
SR-78	UR-1	
SR-79		The MWS will be provided as Government Furnished Equipment (GFE) and be physically installed by your company.
SR-80		The MWS will be provided as Government Furnished Equipment (GFE) and be physically installed by your company.
SR-81		The cockpit unit is provided with sufficient 28 VDC power.
SR-82	UR-43	
SR-83		Wiring in wing available to pod: 6 discrete wires, shielded wires suitable for data bus, 115VAC 400Hz power.
SR-84		Your company has access to a qualified Power Conversion Unit, converting 115VAC 400Hz to 28VDC.
SR-85		The PCU can output a maximum of 250W. The power required to ignite a payload is up to 126W for a period of up to 20ms
SR-86	UR-22	

For traceability from UR-x and description in text in the Terma Case.PDF to requirements in this documents please look in appendix B.

6. Notes.

6.1 Glossery

Body frame format	Direction of aircraft relative to flight direction

6.2 Abbriviations

UR	User Requirement
FR	Functional Requirement
GFE	Government Furnished Equipment
MWS	Missile Warning System
CCU	Cockpit Control Unit
BC	Bus Controller
RT	Remote Terminal
DSS	Digital Sequencer Switches
ECU	Electronic Control Unit
PCU	Power Conversion Unit
AMC	Aircraft Mission Computer
DOD	Department Of Defence
EMC	Electromagnetic compatibility
LRU	Line Replaceable Unit

7. Appendixes.

7.1   Appendix A: Explanation

Threat Response Subystem	When the AMC receives information about threats that are detected by the MWS, This subsystem will determine the response with respect to automatic semiautomatic or manual dispensing of chaffs and flares according to a Countermeasure program.
Countermeasure program	A preprogrammed sequence of dispensing chaffs and or flares in certain directions with a certain timing
Thread pattern	A thread pattern is a certain number of threads attacking the aircraft from certain angles

7.2   Appendix B: Terma Case RTM
Please refer to enclosed RTM sheet: Terma case RTM.PDF.