

TISYE1

Terma case by Group C

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Number of pages:	5

Document ID: TC_SPS_SRS_V1.1
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Version history

ID	Date	Initials	Description
1.0	06-02-2014	ALL	First release of SRS.
1.1	11-02-2014	ALL	Clarify SR-10 Remove UR id SR-1,2,3 SR-18,19 change "may not" to "must not" Clarify SR-19 Added Concept of Operations figure
1.2	22-02-2014	RN	Fixed wrong system requirement description in traceability matrix

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1 Scope

1.1 Identification

This System Requirement Specification (SRS) - Version 1.0 identifies, specifies and establishes the detailed system requirement for the Self Protection Suite as set forth by the Systems engineering exercises and teaching materials - version 1.4 [?]. The SRS further specifies the methods to be used to ensure that each requirement has been met.

1.2 System overview

The purpose of the SRS is to provide Royal Danish Air Force with a self-protection suite for the F-16 combat aircraft which will dispense payloads and host the MWS. The system will provide warning upon detection of missile threats and automatically dispense payloads in response.

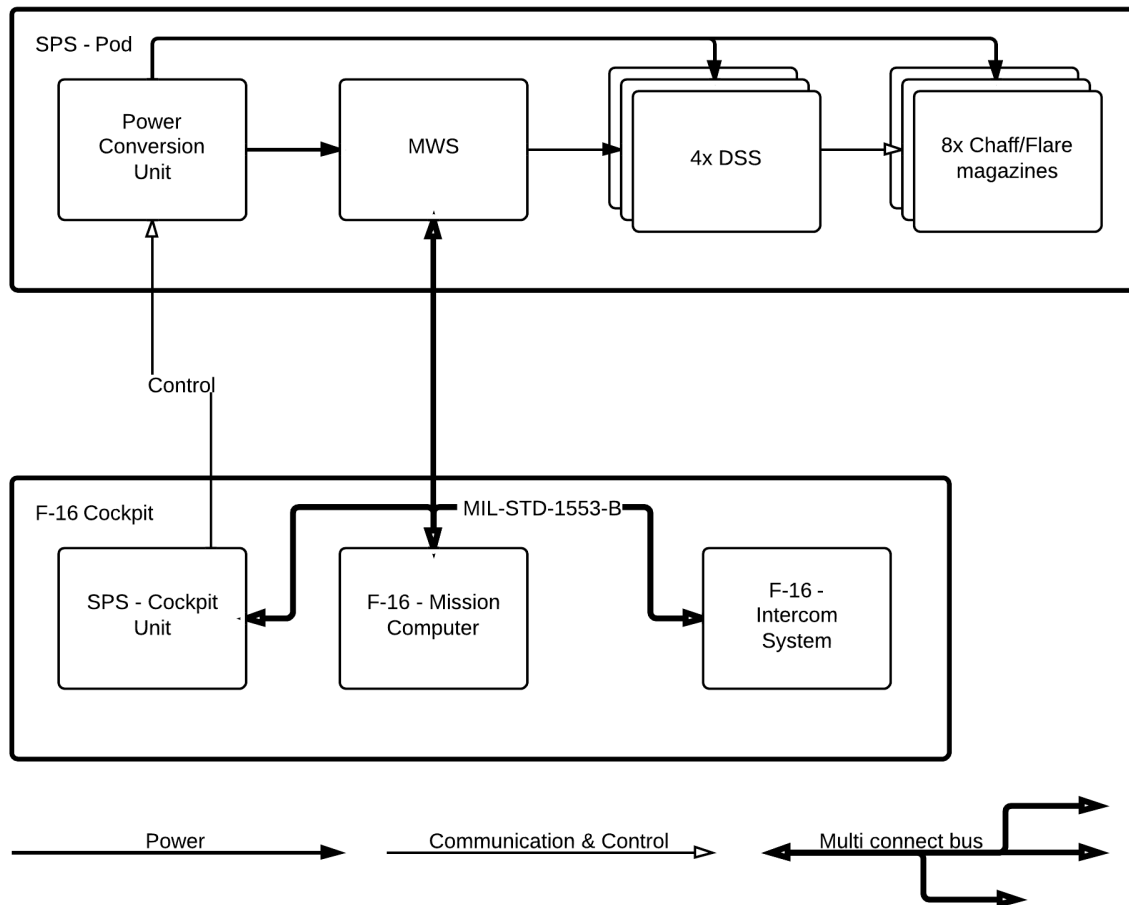


Figure 1.1: Concept of operations

1.3 Document overview

This section has been tailored out. See Table of Contents.

3 Requirements

3.1 Required states and modes

- SR-1 The system shall be able to operate in manual mode which will dispense the program selected by the pilot.
- SR-2 The system shall be able to operate in semi-automatic mode which will initiate an intelligent threat response upon consent from the pilot.
- SR-3 The system shall be able to operate in automatic mode which will initiate an intelligent threat response without pilot interaction.

3.2 System capability requirements

- SR-4 The pod shall include a minimum of eight standard magazines.
- SR-5 The pod shall be able to dispense forwards, downwards and sideways.
- SR-6 Threats shall be transmitted to the aircraft mission computer in body frame format (relative to aircraft) for displaying purposes.
- SR-7 The system shall provide the aircraft mission computer with current status information.
- SR-8 The system shall run built-in test and make the results available to the aircraft mission computer.
- SR-9 The system shall provide the aircraft intercom system audio cues and warnings.
- SR-10 The system status on individual LRU level shall be provided to the pilot in the cockpit unit to the mission computer.
- SR-11 The cockpit unit shall be able to control power of dispensing system and MWS.

SR-12 The system shall be able to dispense the payloads in a preloaded program.

SR-13 The payload patterns shall be programmable by the customer adjusting which payloads should be fired at which rate.

3.3 System external interface requirements

SR-14 The cockpit unit shall communicate with the mission computer via a MIL-STD-1553-B data bus.

SR-15 The system shall interface the aircraft intercom system via the MIL-STD-1553-B databus.

SR-16 The system shall provide a method of loading software to MWS.

3.4 System internal interface requirements

SR-17 The cockpit unit shall communicate with the MWS via a MIL-STD-1553-B data bus

3.5 Safety requirements

SR-18. The system must not obstruct the current weapon systems physically.

SR-19. The system response time for any given process must not exceed 5 ms, as not to hold up the mission computer.

SR-20. The system shall include a hardware implemented safety interlock to prevent dispensing on ground.

3.6 Security and privacy requirements

SR-21 The system shall be able to erase sensitive data upon input from a discrete zeroize signal from the mission computer.

3.7 System environment requirements

SR-22 The pod structure shall remain intact when exposed to steady state acceleration levels of 5g fore 2.5g aft, 25g up, 11g down.

SR-23 The pod shall be operational at temperatures of 95 degree Celcius on outer skin and 102 degree Celcius on leading edge for 25 minutes.

SR-24 The pod shall be operational at temperatures of 134 degree Celcius on outer skin and 151 degree Celcius on leading edge for 3 minutes.

3.8 System quality factors

SR-25 The system shall be able to dispense a minimum of two payloads simultaneously.

SR-26 The system can dispense a minimum of 20 payloads per second.

SR-27 The system shall provide the optimal coverage against missile threats

3.9 Design and construction constraints

SR-28 The pod shall be mounted on the aircraft wing with standard T-hooks spaced by 13 inches.

SR-29 The total weight of pod cannot exceed 270 kg.

SR-30 The pod shall be mounted on the left-hand wing.

SR-31 The power consumption of the pod shall not exceed 700W.

4 Quality provisions

The following describes by which method each Specification Requirement (SR) will be quality tested.

SR-1: Demonstration and test

SR-2: Demonstration, test and analysis

SR-3: Demonstration, test and analysis

SR-4: Inspection

SR-5: Demonstration and test

SR-6: Demonstration, test and analysis

SR-7: Test and analysis

SR-8: Demonstration and test

SR-9: Demonstration and test

SR-10: Demonstration and test

SR-11: Test

SR-12: Demonstration and test

SR-13: Test

SR-14: Test and analysis

SR-15: Test and analysis

SR-16: Test and analysis

SR-17: Test and analysis

SR-18: Inspection

SR-19: Test and analysis

SR-20: Demonstration and test

SR-21: Test and analysis

SR-22: Test and analysis

SR-23: Test and analysis

SR-24: Test and analysis

SR-25: Demonstration and test

SR-26: Demonstration and test

SR-27: Analysis

SR-28: Inspection

SR-29: Inspection

SR-30: Inspection

SR-31: Test and analysis

5 Requirements traceability

5.1 Forward Traceability Matrices

ID	User Requirement	System Reference
UR-1	The pod shall include a minimum of eight standard magazines	SR-??
UR-2	The pod shall be able to dispense forwards, downwards and sideways	SR-??
UR-3	Introduction of the system may not compromise the operation of the current weapon system	SR-??, SR-??
UR-4	The pod shall be mounted on the left-hand wing	SR-??
UR-5	Threats shall be transmitted to the aircraft mission computer in body frame format (relative to aircraft) for displaying purpose	SR-??
UR-6	The system shall provide the aircraft mission computer with status information and built-in test result	SR-??, SR-??
UR-7	The system shall interface the aircraft intercom system to provide audio cues and warning	SR-??, SR-??
UR-8	The system shall include a hardware implemented safety interlock to prevent dispensing on ground	SR-??
UR-9	The system shall be able to erase sensitive data upon input from a discrete zeroize signal from aircraft	SR-??
UR-10	The system status on individual LRU level shall be provided by cockpit unit	SR-??
UR-11	The cockpit unit shall be able to control power of dispensing system and MWS	SR-??
UR-12	The system shall comprise at least three modes, manual, semi-automatic and automatic	SR-??, SR-??, SR-??
UR-13	Manual mode shall dispense the program selected by the pilot	SR-??

Table 5.1: Forward Traceability Matrix - Part one

ID	User Requirement	System Reference
UR-14	Semi automatic shall initiate an intelligent threat response upon consent from the pilot	SR-??
UR-15	Automatic mode shall initiate an intelligent threat response without pilot interaction	SR-??
UR-16	The system shall provide a method of loading software to MWS	SR-??
UR-20	The system shall be able to dispense a minimum of two payloads simultaneously	SR-??
UR-21	The system shall be able to dispense an intelligent pattern of payloads programmable by the customer	SR-??, SR-??
UR-22	The system shall provide the optimal coverage against missile threats	SR-??
UR-30	The pod structure shall remain intact when exposed to steady state acceleration levels of 5g fore 2.5g aft, 25g up, 11g down	SR-??
UR-31	The total weight of pod cannot exceed 27 kg	SR-??
UR-32	The pod shall be operational at temperatures of 95 degree Celcius on outer skin and 102 degree Celcius on leading edge for 25 minutes	SR-??
UR-33	The pod shall be operational at temperatures of 134 degree Celcius on outer skin and 151 degree Celcius on leading edge for 3 minutes	SR-??
UR-40	The cockpit unit shall communicate with the MWS via a MIL-STD-1553-B data bus	SR-??
UR-41	The cockpit unit shall communicate with the mission computer via a MIL-STD- 1553-B data bus	SR-??
UR-42	The pod shall be mounted on the aircraft wing with standard T-hooks spaced by 13 inches	SR-??
UR-43	The power consumption of the pod shall not exceed 700W	SR-??

Table 5.2: Forward Traceability Matrix - Part two

5.2 Backward Traceability Matrices

System Reference	Functional Requirement	ID
SR-??	The system shall be able to operate in manual mode which will dispense the program selected by the pilot.	UR-12, UR-13
SR-??	The system shall be able to operate in semi-automatic mode which will initiate an intelligent threat response upon consent from the pilot.	UR-12, UR-14
SR-??	The system shall be able to operate in automatic mode which will initiate an intelligent threat response without pilot interaction.	UR-12, UR-15
SR-??	The pod shall include a minimum of eight standard magazines	UR-1
SR-??	The pod shall be able to dispense forwards, downwards and sideways	UR-2
SR-??	Threats shall be transmitted to the aircraft mission computer in body frame format (relative to aircraft) for displaying purposes	UR-5
SR-??	The system shall provide the aircraft mission computer with current status information	UR-6
SR-??	The system shall run built-in test and make the results available to the aircraft mission computer	UR-6
SR-??	The system shall provide the aircraft intercom system audio cues and warnings	UR-7
SR-??	The system status on individual LRU level shall be provided by cockpit unit	UR-10
SR-??	The cockpit unit shall be able to control power of dispensing system and MWS	UR-11
SR-??	The system shall be able to dispense the payloads in a preloaded program	UR-21
SR-??	The payload patterns shall be programmable by the customer adjusting which payloads should be fired at which rate	UR-21
SR-??	The cockpit unit shall communicate with the mission computer via a MIL-STD-1553-B data bus	UR-41

Table 5.3: Backward Traceability Matrix - Part one

System Reference	Functional Requirement	ID
SR-??	The system shall interface the aircraft intercom system via the MIL-STD-1553-B databus	UR-7
SR-??	The system shall provide a method of loading software to MWS	UR-16
SR-??	The cockpit unit shall communicate with the MWS via a MIL-STD-1553-B data bus	UR-40
SR-??	The system may not obstruct the current weapon systems physically	UR-3
SR-??	The system response time for any given process must not exceed 5 ms, as not to hold up the mission computer.	UR-3
SR-??	The system shall include a hardware implemented safety interlock to prevent dispensing on ground	UR-8
SR-??	The system shall be able to erase sensitive data upon input from a discrete zeroize signal from the mission computer	UR-9
SR-??	The pod structure shall remain intact when exposed to steady state acceleration levels of 5g fore 2.5g aft, 25g up, 11g down	UR-30
SR-??	The pod shall be operational at temperatures of 95 degree Celcius on outer skin and 102 degree Celcius on leading edge for 25 minutes	UR-32
SR-??	The pod shall be operational at temperatures of 134 degree Celcius on outer skin and 151 degree Celcius on leading edge for 3 minutes	UR-33
SR-??	The system shall be able to dispense a minimum of two payloads simultaneously	UR-20
SR-??	The system can dispense a minimum of 20 payloads per second	
SR-??	The system shall provide the optimal coverage against missile threats	UR-22
SR-??	The pod shall be mounted on the aircraft wing with standard T-hooks spaced by 13 inches	UR-42
SR-??	The total weight of pod cannot exceed 270 kg	UR-31
SR-??	The pod shall be mounted on the left-hand wing	UR-4
SR-??	The power consumption of the pod shall not exceed 700W	UR-43

Table 5.4: Backward Traceability Matrix - Part two