

## TST102 Fundamentals of Test Evaluation

### Lesson 19 - Assignment

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#### Assignment 2: SRAW Test Data Analysis

Based on positive results in DT&E and following a successful Operational Test Readiness Review, the SRAW entered IOT&E. The IOT&E plan called for three phases with the first phase (20 shots) being focused on squad-level activities in a fixed-position defensive scenario. Results were mixed during this first phase and after a Marine was injured while attempting to employ the SRAW, testing was suspended until a safety investigation could be completed in order to address and/or mitigate any identified risks. That investigation is on-going.

The Program Manager and Operational Test Director agreed to take advantage of this break in testing to conduct an analysis of the IOT&E results to date. **Your assignment is to analyze these test results by answering the questions on page 4 of this lesson.**

Note that although this assignment and the Lesson 17 assignment both deal with SRAW testing, the tests in the two assignments are distinct. While the Lesson 17 assignment covers DT&E on one aspect of the SRAW, this assignment covers IOT&E and necessarily looks at the system as a whole.

Lastly, the Probability of Hit numbers provided on page 3 predict how often the SRAW will hit the target for a given number of shots aimed at that target (assumes a successful launch). In reality, the actual Probability of Hit metric spans a continuum with the probabilities varying with, among other things, range to the target, target maneuvering, and the use of countermeasures. The ranges and probabilities provided are simply points on that continuum and are not meant to signify ranges that the SRAW should or should not be used at (the minimum and maximum ranges do that). As such, there is no attempt to take shots at the ranges listed in the Probability of Hit row nor should there be.

**Save you data analysis in MSWord (.doc or .docx) format. When you are ready to submit your analysis for grading, navigate to the Assignments section of the course (outside of this content window) for instructions. A passing grade is required for graduation.**



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**SRAW IOT&E Summary of Results**

Shot #	Time/Date (Apr)	Target Range (1)	Target Course (2)	TGT Speed (km/hr)	Motor Function?	SRAW Armed? (3)	Tgt Hit? (3)	Remarks
1	1000/04	122	095	13	Yes	Yes	Yes	
2	1615/05	289	206	11	Yes	Yes	Yes	High Winds (4)
3	1245/06	197	243	19	Yes	No	Yes	
4	0930/09	594	168	25	Yes	Yes	No	
5	1535/10	393	145	20	No	No	No	Hang Fire
6	1110/11	426	190	5	Yes	Yes	No	
7	0950/12	650	205	15	Yes	Yes	Yes	High Winds (4)
8	1545/12	48	195	7	Yes	Yes	Yes	
9	1300/16	720	175	20	Yes	Yes	No	
10	1345/17	95	255	12	No	No	No	Marine Injured

- Notes:**
- (1) Target Range is the distance in meters from the shooter to the target when missile launch was commanded (when the SRAW "trigger" is pulled). Target speed is in km/hr
  - (2) Target course is relative to the shooter with 180 being movement directly towards the shooter and 090/270 being movement perpendicular to the line of sight from the shooter to the target (090 means the target is moving left to right from the shooter's perspective).
  - (3) Without other mitigating data, interpret "SRAW Armed" as functioning of the SRAW's safe-arm device (i.e., did the SRAW arm itself?) and interpret "tgt Hit" as performance of the SRAW's targeting system.
  - (4) High winds denotes any shot taken in sustained winds over 20 km/hr



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**SRAW KPPs, KSAs, and CTPs**

Use the following performance metrics for this analysis:

Key Performance Parameters	Production Threshold	Production Objective
Minimum Engagement Range	17 Meters	17 Meters
Maximum Engagement Range	600 Meters	800 Meters
Probability of hit (stationary target)	0.6 at 300 Meters 0.5 at 600 Meters	0.8 at 300 Meters 0.7 at 600 Meters 0.5 at 800 Meters
Probability of hit (moving target)	0.5 at 300 Meters 0.4 at 600 Meters	0.6 at 300 Meters 0.5 at 600 Meters 0.4 at 800 Meters
Key System Attributes	Production Threshold	Production Objective
Reliability	0.95	0.97
Critical Technical Parameters	Production Threshold	Production Objective
Minimum Safe Arming Distance	15 Meters	15 Meters



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##### Data Analysis Questions

- **Question #1:** With regard to the injured Marine and without knowing exactly what happened, what areas should the investigation look into in terms of conducting a fault analysis and what (if any) implications might there be for the SRAW program when correcting identified deficiencies?
- **Question #2:** Given the Threshold and Objective KPP values for Maximum Range (see the table on the previous page) and noting that the results for shots 4 and 9 were essentially the same (in both cases the motor functioned and the SRAW armed itself but both missed the target), describe why not hitting the target on shot 4 is different from not hitting the target on shot 9. Which result is more problematic from a SRAW performance perspective and why?
- **Question #3:** When considering the shots individually, does not hitting the target during shots 4 and 5 reflect individual failures of the SRAW targeting system? In each case, why or why not?
- **Question 4:** Given that IOT&E examines mission effectiveness (in this case target destruction) and assuming that target destruction occurs when a SRAW launches and arms successfully and then hits the target, note that neither shot 3 nor shot 4 destroyed the target. Are these two failures equivalent? Why or why not? Which (if any) is more problematic from a SRAW performance perspective and why?
- **Question #5:** What **one** initial conclusion (positive or negative) might an advocate or critic of the system highlight? Make sure this conclusion is not simply an observation and cite the data used to support the conclusion. As an example, an observation might be that the SRAW hit the target X of Y times. A conclusion might be that based on the results of shots a, b, c, f, g, and j, the system is on track to meet the Threshold Probability of Hit requirement for moving targets.

If you have questions specific to this assignment, email TST102@dau.edu with your question(s); an instructor will respond as soon as possible.

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