

UNCLASSIFIED

Draft v X.X, for FASIT WG w/industry

Capability Production Document

For

**(U) Future Army System of Integrated Targets (FASIT)
Increment 1**

Sponsoring Agency: US Army

Signature Authority: DCS G-3/5/7

Date Submitted: DD/MMM/YYYY

Primary & Secondary POCs

Name	Title/Position	Phone	Email
Matthew F. Golden	Target Development Team Chief	757 878 0553	NIPR: matthew.f.golden.civ@mail.mil
John V. Arbino	JCIDS writer – Contractor	757 878 0514	NIPR: john.v.arbino.ctr@mail.mil

Proposed Validation Authority: US Army

Proposed MDA: PEO Simulation, Training and Instrumentation

Proposed JSD: US Army

Proposed ACAT: III

Releasability: Further dissemination only as directed by ATIC-LTR, Ft Eustis, VA, or higher authority. This determination was made on 20 April 2015.

UNCLASSIFIED

UNCLASSIFIED DRAFT

39 (U) Validation Page

40 This document has not yet been validated, and shall not be considered to be an authoritative source for the
41 content herein. This document may be considered authoritative only when this page has been replaced by a
42 signed validation memorandum from the appropriate validation authority.
43

DRAFT

UNCLASSIFIED DRAFT

44 (U) Executive Summary

45
46 The purpose of the Future Army System of Integrated Targets (FASIT) Capability Production
47 Document (CPD) is to update the Operational Requirements Document (ORD) for the New Generation
48 Army Targetry System (NGATS), approved 11 Jun 96. This includes converting the ORD into the new
49 format CPD as the FASIT CPD. This conversion to the new JCIDS format is warranted as the architecture
50 of the system currently in production has been substantially modified in the course of production.
51

52 The Future Army System of Integrated Targets (FASIT) will provide a targetry system to prepare
53 adaptive Army Leaders for a complex world, while ensuring the force is prepared to be globally responsive
54 and regionally engaged. To accomplish this, there is an immediate and critical need to train Soldiers and
55 leaders in the conduct of Army tactical ground-to-ground, air-to-ground, air-to-surface, and surface-to-
56 surface engagements for Force-on-Target training events and to set conditions on training ranges by
57 providing targets that represent a determined, adaptive enemy organization. FASIT shall be employed by
58 company, battalion, and brigade commanders to support training of U.S. Army forces during live-fire
59 exercises at home stations, maneuver Combat Training Centers, and theaters of operations.
60

61 FASIT is a component of the Live Training Transformation-Family of Training Systems (LT2-FTS)
62 and provides common scenario development, exercise control, AAR collection and presentation,
63 administrative support, communication infrastructure, target presentation/representation, weapons effect
64 measurement, and battlefield/area weapon effects. As a training enabler, the FASIT shall make every effort
65 possible to ensure full interoperability within the Integrated Training Environment (ITE) IAW TRADOC
66 Policy Letter 20, Acquisition of Training Aids, Devices, Simulators and Simulations (TADSS), Games for
67 Training and Terrain Databases, dated 21 Apr 14.
68

69 The FASIT shall include all components required for a ready and modern Army to maintain a
70 decisive edge by maximizing assigned weapon systems, which supports the Live-Fire of Live, Virtual and
71 Constructive (LVC) training (skills qualification, sustainment training, and collective exercises). The
72 FASIT shall include seamless integration, among multiple vendors, with training simulation capabilities.
73 The FASIT system integration shall take every effort to minimize the system's logistics footprint and reduce
74 the total ownership cost. FASIT shall achieve this while meeting the challenges of a wide range of threats
75 and prepare the Warfighter to incorporate robust technologies in ever evolving operating environments.
76

77 FASIT shall provide the Army with a standard targetry system and architecture, to include standard
78 government-off-the-shelf (GOTS) software for range operating systems, which supports the full scope of
79 live-fire training from home station to Combined Training Centers (CTC) to deployed locations. The
80 FASIT end state is to reinforce tactics, techniques, and procedures to further enhance training capabilities.
81
82
83
84
85
86
87
88

UNCLASSIFIED DRAFT

89	<u>(U) Table of Contents</u>	
90		
91	(U) Validation Page	1
92	(U) Executive Summary	2
93	(U) Table of Contents	2
94	1 (U) Operational Context	4
95	1.1 (U) Validated Source Document Citation	4
96	1.2 (U) Operational Context Summary	5
97	2 (U) Threat Summary	5
98	2.1 (U) Threat Assessment Citation	5
99	2.2 (U) Threat Summary Outline	5
100	3 (U) Capability Discussion	6
101	3.1 (U) Validated Capability Requirements Overview	6
102	3.2 (U) Related Analysis and Studies Summary	7
103	3.3 (U) Supported ICDs and Related CDDs/CPDs/Joint DCRs	7
104	4 (U) Program Summary	9
105	4.1 (U) Program Strategy	9
106	4.2 (U) IOC and FOC Definitions for the current increment	9
107	5 (U) Production KPPs, KSAs, and APAs	10
108	5.1 (U) Mandatory KPPs	10
109	5.2 (U) Additional KPPs, KSAs, or Attribute	14
110	5.3 (U) KPP/KSA/Other Attributes Rollup	19
111	6 (U) Other System Attributes	35
112	6.1 (U) Embedded Instrumentation, EA and WARM requirements	35
113	6.2 (U) Human System Integration	35
114	6.3 (U) Natural Environmental Factors	36
115	6.4 (U) Physical and Operational Security	36
116	6.5 (U) Weather, Oceanographic, and Astrophysical Support	36
117	6.6 (U) Allied Coalition Support	36
118	6.7 (U) Transportability and deployability considerations	36
119	6.8 (U) SWaP-C margin requirements/open systems attributes	37
120	7 (U) Spectrum Requirements	37
121	7.1 (U) Electromagnetic Environmental Effects (E3) Summary	37
122	7.2 (U) Spectrum Summary	37
123	8 (U) Intelligence Supportability	37
124	8.1 (U) Intelligence Support	37
125	8.2 (U) Compliance with Intelligence Policy	38
126	9 (U) Weapon Safety Assurances	38
127	10 (U) Technology Readiness	38
128	10.1 (U) Technology Challenges	38
129	10.2 (U) Technology Readiness Assessment	39
130	11 (U) DOTmLPP-P Considerations	39
131	11.1 (U) Doctrine	39
132	11.2 (U) Organization	39
133	11.3 (U) Training	40
134	11.4 (U) Materiel	40

UNCLASSIFIED DRAFT

135 11.5 (U) Leadership 40

136 11.6 (U) Personnel 40

137 11.7 (U) Facilities 40

138 11.8 (U) Policy Issues 40

139 12 (U) Program Affordability 40

140 12.1 (U) Life Cycle Cost Analysis Citation 40

141 12.2 (U) Summary of Resources Required 40

142 (U) Appendix A: References 41

143 (U) Appendix B: Acronyms 42

144 (U) Appendix C: Glossary 45

145 (U) Appendix D: (Optional) Classified Annex **Error! Bookmark not defined.**

146 (U) Supporting Documents (Separate File) **Error! Bookmark not defined.**

147

148 **Tables and Figures**

149 Figure 1.1 – OV-1 FASIT Capability 1

150 Table 3.3 – CPD Contributions 4

151 Table 7.1 – Data Throughput 23

152 Table 10.1 – Critical Technology Elements 25

153 Table 10.2 – Technology Readiness Level 25

154 Table 12.2 – Summary of Resources Required 27

(U) Revision History

Version #	Date	Purpose
FASIT WG (Draft CPD)	5 November 2015	Inform Industry of FASIT Requirements

158

159

160 1 (U) Operational Context FASIT shall provide targetry systems to provide the Army with a capability for

161 realistic training and weapons qualification for Soldiers and weapon systems while meeting the

162 commander’s complete scope of unit live-fire training capabilities. The following capability gaps will be

163 addressed in future increments as Objective requirements: maritime targets; autonomous moving targets,

164 augmented reality threat, neutral and friendly presentations, round discrimination data; realistic target

165 signatures; emerging electronics-based battlefield friend-or-foe concepts, such as, millimeter wave (MMW)

166 radar and cooperative target identification (ie Identification Friend or Foe (IFF)).

167

168 1.1 (U) Validated Source Document Citation

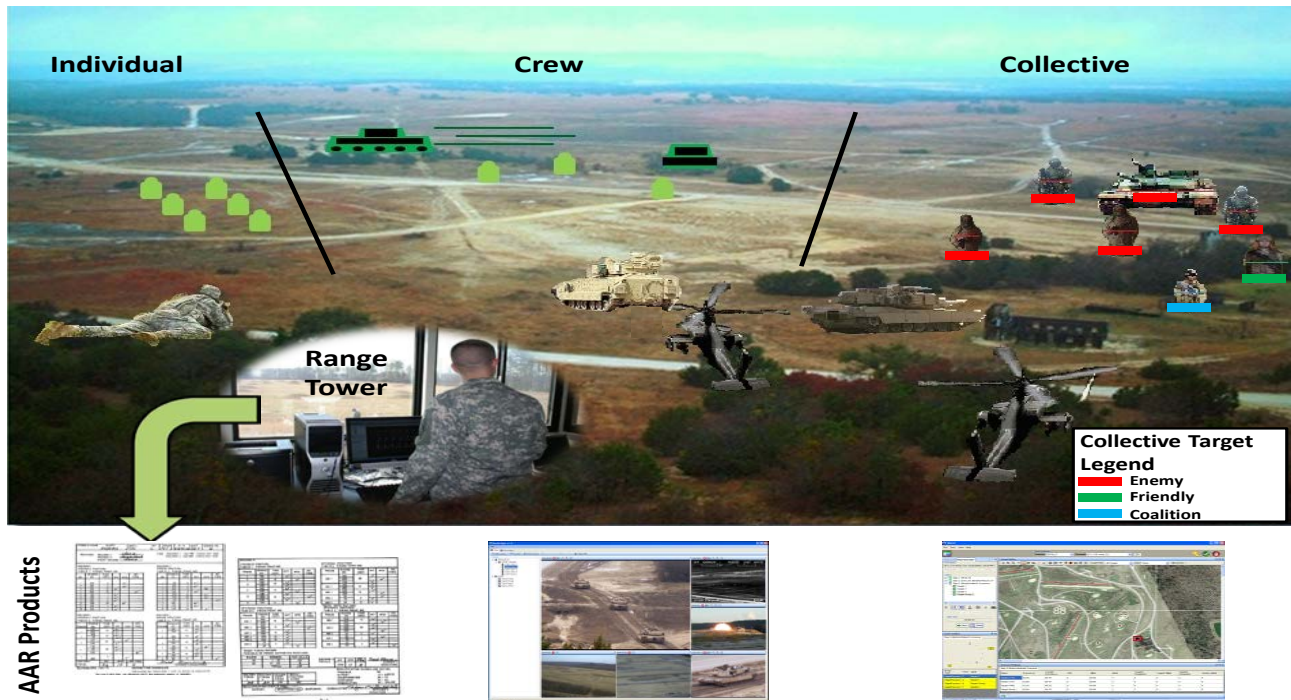
- 169 1.1.1 Combat Training Center Instrumentation System (CTC-IS), CPD, 29 Apr 10
- 170 1.1.2 Live Training Transformation-Family of Training Systems (LT2-FTS) ICD, 11 Aug 05
- 171 1.1.3 Integrated-MOUT Training System (I-MTS) ORD, CARDS #2517, 6 Aug 04
- 172 1.1.4 Digital Multipurpose Range Complex (DMPRC) ORD, CARDS #2512, 27 Sep 99
- 173 1.1.5 Next Generation Army Targetry System (NGATS) ORD, CARDS #02006, 11 Mar 96
- 174 1.1.6 Targetry and Simulator Device System (TSDS) of the Joint Readiness Training Center (JRTC) Live
- 175 Fire ORD, CARDS #2505, 26 Oct 94
- 176 1.1.7 Remoted Target System (RETS) Training Device Requirement (TDR), CARDS #0256R, 4 Jan 90

UNCLASSIFIED DRAFT

177 1.1.8 Homestation Instrumentation Training System (HITS), CARDS #2541, 1 Feb 11

178

179 1.2 (U) Operational Context Summary. The Future Army System of Integrated Targets (FASIT) supports
180 the full scope of live-fire training, to include development and presentation of After Action Review (AAR).
181 FASIT shall support Force-on-Target (FOT) live-fire training, from individual marksmanship and crew-
182 served weapons to combined arms FOT training exercises up to the Brigade Combat Team (BCT). FASIT
183 will enable training at home station ranges, Combat Training Centers (CTC), deployed training
184 environments, and institutions. FASIT supports Line of Sight (LOS) and Non-Line of Sight (NLOS), 2D,
185 3D, and multi-spectral targets, as well as integration with Unmanned Aerial System (UAS) and Unmanned
186 Ground System (UGS) capabilities. Capabilities will include stimulating Warfighting Functions in the live
187 FOT training environment.
188



189
190 **Figure 1-1 OV-1 FASIT Capability**
191

192 2 (U) Threat Summary

193

194 2.1 (U) Threat Assessment Citation. For additional detailed threat information, refer to the following threat
195 references: Soldier as a System (SaaS) System Threat Assessment Report (STAR), dated 30 Apr 12; and
196 Land Warfare Capstone Threat Assessment, (S//NF) dated 25 May 2011. The threat is also addressed in the
197 Department of the Army G-2 validated Army Live, Virtual, Constructive Training STAR, 4 May 2009.
198

199

200 2.1.1 (U) Most current DIA or Service validated threat analysis. The FASIT is for training and does not
201 have enemy threat implications.

202

203 2.2 (U) Threat Summary Outline

The FASIT is a targetry system and does not have critical intelligence parameters (CIPs).

UNCLASSIFIED DRAFT

204

205 2.2.1 (U) Threats to be Countered

206 FASIT is a training system and is not designed to counter or target threats or to operate in a threat
207 environment.

208

209 2.2.2 (U) System Specific Threats

210 FASIT may be exposed to the same threats as all other simulations used for training. The most stressful
211 threats to FASIT are those involving computer network operations and electronic warfare. Computer
212 network operations threats include computer network exploitation efforts to extract information from the
213 system and are often a precursor to computer network attacks. Computer network attacks include activities
214 designed to deny, degrade, disrupt, or destroy computer data, systems, and networks, and may include the
215 introduction of malicious code and viruses to corrupt or deny data. Electronic warfare threats include
216 jamming of signals. Within the computer network operations threat, one of the greatest threats to FASIT is
217 the authorized user and trusted insider threat where someone could access the operating system and either
218 exploit or attack the network from the inside. Other threats to FASIT may include physical threats and other
219 information collection threats (internal and external).

220

221 2.2.3 (U) Operational Environment

222 FASIT is a live-fire Force on Target training system for use on approved live-fire ranges.

223

224 3 (U) Capability Discussion The FASIT shall provide a standalone system (not connected to network) for
225 all FOT training ranges with a realistic, live operational target environment for the full range of military
226 operations. FASIT shall be comprised of a mix of realistic stationary and moving, personnel and vehicle
227 targets and mechanisms; associated simulator devices; and control system, using plug-and-play technology.
228 FASIT shall provide realistic training at CONUS, OCONUS, and CTC locations which provide actionable
229 feedback through After Action Reviews (AARs) for unit improvement and/or sustainment. Two-way
230 communication between the downrange devices and the control devices shall be through the Universal
231 Target Controller (UTC). Connectivity to the LVC-Integrating Architecture will be executed through a
232 higher-level training instrumentation system, such as, Digital Range Training System (DRTS), Combat
233 Training Center-Instrumentation System (CTC-IS), and Training Instrumentation System (T-IS), etc.

234

235 3.1 (U) Validated Capability Requirements Overview

236 Validated capability requirements and associated capability being addressed by the FASIT CPD:

237

238 3.1.1 (U) CTC-IS, CPD, 29 Apr 10, supports the collection of specific, battle-focused player information on
239 war-fighting performance. CTC-IS provides tools to analyze training performance information and provide
240 detailed and tailored performance feedback to the units. The NTC and JRTC use the CTC-IS for exercise
241 planning; system preparation and monitoring; data collection, management and analysis; preparation and
242 presentation of training performance feedback; and exercise control and safety.

243

244 3.1.2 (U) LT2-FTS ICD, CARDS #2552, 11 Aug 05, identifies the need for units to possess the ability to
245 interface with LVC facilities and systems while training on live-fire complexes. The ICD for LT2-FTS also
246 identifies the need for live employment of enhanced and future systems which require larger ranges and
247 training land for either impact of munitions or firing locations rearward of current positions and the ability
248 to electronically integrate players in various locations and training environments which can be used
249 throughout the joint force training environment.

UNCLASSIFIED DRAFT

250

251 3.1.3 (U) I-MTS ORD, CARDS #2517, 6 Aug 04. The I-MTS ORD documents collection of exercise data
252 from tactical engagement simulation (TES) TADSS, targetry, other system and non-system TADSS,
253 Observer/Controllers (O/C), external simulation and stimulation (SIM/STIM) systems, within the Urban
254 Operation Training facilities. The I-MTS will monitor and control the training exercise; process, display,
255 and analyze collected exercise data; prepare and present standardized training performance feedback; and
256 archive training performance information for external use. I-MTS supports both Live Fire, and FOF/FOT
257 training events using scenario-based simulated and/or actual OPFORs in support of the training unit's
258 METL and training objectives. I-MTS is designed to support both analog and modernized/digital units in an
259 urban environment at home station and the maneuver CTCs.

260

261 3.1.4 (U) NGATS ORD, CARDS #02006, 11 Mar 96. The NGATS ORD describes capabilities that will be
262 used for training management in a continuous process centering on feedback to enable leaders to properly
263 focus peacetime training on the wartime mission.

264

265 3.1.5 (U) DMPC ORD, CARDS #2512, 27 Sep 99. The DMPC ORD supports live fire exercises (LFXs)
266 for individual and crew served weapon skill qualification and sustainment, and, collective training events at
267 local training areas, combat training centers, and in tactical force projection environments. Range
268 Operations personnel use the results of training exercise plans to prepare the DMPC for exercise
269 execution; during exercise execution, range personnel use new generation range subsystems to provide
270 realistic friendly, neutral, and threat stimulators, and collect audio, video and digital training data; and after
271 exercise execution, DMPC subsystems support training data analysis, preparation, presentation and
272 feedback for AAR.

273

274 3.1.6 (U) TSDS ORD, CARDS #2505, 26 Oct 94. The TSDS is targetry and simulator equipment that will
275 support Combined Arms Live Fire Exercises (CALFEX). TSDS consists of portable and stationary target
276 lifting mechanisms, hand-held control device, RG control modules, sound effects simulator, and Multiple
277 Integrated Laser Engagement System (MILES) shoot-back devices.

278

279 3.1.7 (U) RETS TDR, CARDS #0256R, 4 Jan 90. The RETS TDR documents the Reliability, Availability
280 & Maintainability (RAM) requirements for the targets and expected training capabilities to be provided by
281 the material developer.

282

283 3.2 (U) Related Analysis and Studies Summary

284 3.2.1 Summarize all Analyses – Since this is a conversion of an existing requirement document an Analysis
285 of Alternatives was not conducted. The KPPs and KSAs were developed based on input from Subject
286 Matter Experts in the Sustainable Range Program and Army Centers of Excellence.

287

288 3.2.2 Recommendation and Conclusion – (Not Included/FOUO)

289

290

291

292

293

294 3.3 (U) Supported ICDs and Related CDDs/CPDs/Joint DCRs

295

UNCLASSIFIED DRAFT

Capability Requirement	CPD Contribution	Related CDDs	Related ORD/CPDs
Exercise Control & Feedback	CTC-IS captures the rotational training unit's engagements, decision, and actions throughout the operational environment. The rotational training unit engages a live and constructive opposing force (OPFOR), instrumented live fire targets, and responds to an array of live, virtual, and constructive entities and simulations which extend the operational environment beyond the physical boundaries of the maneuver area.	CDD title	CTC-IS CPD
Realistic training	Live training systems must replicate, as closely as possible, the capabilities inherent in the operational environment to provide realism and support continuity from the training arena to real world operations		LT2-FTS ICD
Live Fire Training	NGATS ORD supports LFXs for individual and crew served weapon skill qualification and sustainment, and collective training events at local training areas, combat training centers and in tactical force projection environments.		NGATS ORD
Monitor & Control Training	The I-MTS ORD documents the ability to collect exercise data from tactical engagement simulation (TES) TADSS, targetry, other system and non-system TADSS, Observer/Controllers (O/C), external simulation and stimulation (SIM/STIM) systems, within Urban Operation Training facilities		I-MTS ORD
Training Data Analysis	DMPRC ORD documents LFXs for individual and crew served weapon skill qualification and sustainment, and, collective training events at local training areas, combat training centers, and in tactical force projection environments.		DMPRC ORD
Targetry and Simulator	The TSDS ORD documents audio and visual cues to replicate the battlefield scenario. TSDS will have capability of portable and stationary targets, which may be positioned in various groupings to replicate the threat formations required to execute the scenario		TSDS of JRTC ORD
RAM Assessment & Training Materials	(U) Quantitative RAM requirements, measured in cycles/hours, contained in the RETS TDR represent the threshold requirements for the FASIT. The material developer shall also develop the necessary training materials needed to support fielding and sustainment of the FASIT as defined in the TDR		RETS TDR

Table 3.3 CPD Contributions

296
297

UNCLASSIFIED DRAFT

298 4 (U) Program Summary. FASIT shall use an incremental approach to develop, field and upgrade current
299 and future Army ranges. The incremental approach is being used as the desired capability and end-state
300 requirement are known; requirement is met over time.
301

302 4.1 (U) Program Strategy

303 4.1.1 (U) The FASIT CPD documents Threshold requirements; such as those components that are currently
304 fielded.
305

306 4.1.2 (U) The FASIT CPD will also include those capabilities which are Objective requirements, which are
307 not required by doctrine, nor fully developed at this time. These gaps are KPP/KSA/APA Objectives and
308 include maritime targets; autonomous moving targets; augmented reality threat; neutral and friendly
309 presentations; round discrimination data; realistic target signatures; and emerging electronics-based
310 battlefield friend-or-foe concepts, such as, millimeter wave (MMW) radar and cooperative target
311 identification (i.e., Identification Friend/Foe (IFF)).
312

313 4.2 (U) IOC and FOC Definitions for the current increment

314 4.2.1 (U) IOC Definition and target date

315 Initial Operational Capability (IOC) (Target Date: 2019)

- 316 • Actions which constitute attainment of IOC
- 317 – Targetry and components have been tested and accepted by Government
- 318 – Interim sustainment support begins as a bridging strategy to FOC.
- 319 – At a minimum, range can be used at IOC to fully support doctrinal marksmanship and
- 320 gunnery exercises.
- 321 – Training packages for New Equipment Training (NET) (operations and support manuals) are
- 322 completed and validated.
- 323 – Systems have been fielded and accepted by the Government for one of each range type (i.e.,
- 324 portable, lane based, Infantry maneuver, and mounted maneuver).
325

326 4.2.2 (U) FOC Definition and target date

327 Full Operational Capability (FOC) (Target Date: 2023)

- 328 – Achieved when all ranges, regardless of type, that are programmed in FY23 have received
- 329 their authorized allocations and been accepted by the Government.
- 330 – Expected to be completed by Fiscal Year 2023
- 331 • Actions which constitute attainment of FOC
- 332 – Interim sustainment support ends.
- 333 – Life Cycle Management begins. TACOM Life Cycle Management Command (LCMC) is
- 334 able to provide provisioning and support for all devices for the life of the system.
- 335 Refurbishment of ranges that reach Economic Useful Life (EUL) through FY23 have been
- 336 completed.
337

338 4.2.3 (U) Assets Required to Attain IOC and FOC

339
340 4.2.3.1 (U) Assets to attain IOC. IOC will be reached when LCMC and the Program Manager's (PM)
341 resources are in place to meet KPP1, Logistical Support (5.2.1). At least one range of each type (small
342 arms, crew served, and collective ranges) have been revitalized, and one range of each type has been fielded
343 with new equipment that meets threshold requirements.

UNCLASSIFIED DRAFT

344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389

4.2.3.2 (U) Assets to attain FOC. Reaching FOC will not require additional assets, only improving existing assets to meet Objective requirements.

5 (U) Production KPPs, KSAs, and APAs

5.1 (U) Mandatory KPPs

5.1.1 (U) Force Protection

Justification: FASIT is a training system. This statutory KPP is not appropriate for the FASIT capability. This capability is not designed to prevent or mitigate hostile actions against personnel, resources, facilities and critical information.

5.1.2 (U) System Survivability

Justification: FASIT is an enabling training system and does not fit the description of a “manned system” designed to prevent or mitigate hostile actions against personnel. This statutory KPP is not appropriate for the FASIT capability.

5.1.3 (U) Net-Ready

5.1.3.1 (U) Supports Military Operations

5.1.3.2 (U) Enters and is Managed in the Network

5.1.3.3 (U) Exchange Information

5.1.4 (U) Sustainment

Production Threshold: All FASIT devices shall meet requirements listed in most recently approved Performance Specification. FASIT shall have ability to track usage and performance history of the system to validate and monitor availability and reliability data of individual targets and the system as a whole. This will provide data to predict when system replacement/recapitalization is required.

Production Objective: System shall have ability to predict future device/hardware failures based on historical maintenance records.

Rationale: Each system shall be located in a permanent CONUS/OCONUS location. The fixed locations shall have access to maintenance facilities and the capability to store readiness package and repair parts. The systems shall be used on a fixed, predictable schedule that allows ample downtime for scheduled and unscheduled maintenance. The principal components of the systems are commercial off-the-shelf (COTS) components which possess commercial standards of reliability. All targetry maintenance shall be capable of being conducted by government civilians and/or contractor personnel.

5.1.4.1 (U) Sustainment Operational Availability

Production Threshold: All FASIT devices shall provide a 94 percent operational availability for continuous operation on military ranges operating 24 hours per day with at least 99% (probability of mission success without interruption or failure) for a mission duration of 20 days. 24 hour day=20 hours continuous operation per day with 2 hours break for maintenance allocated every 10 hours. 20 day mission duration=10

UNCLASSIFIED DRAFT

390 continuous days with 2 days allocated for reset between each cycle.

391

392 Production Objective: All FASIT devices shall provide a 99 percent operational availability for continuous
393 operation on military ranges operating 24 hours per day with at least 99% (probability of mission success
394 without interruption or failure) for a mission duration of 30 days. 24 hour day=22 hours continuous
395 operation per day with 1 hour break for maintenance allocated every 11 hours. 30 day mission duration=14
396 continuous days with 1 day allocated for reset between each cycle.

397

398 *Rationale:* FASIT shall meet operational availability standards to provide training capability expected by
399 the end user.

400

401 5.1.4.2 (U) Sustainment Materiel Availability

402 Production Threshold: All stationary presentation devices and ancillary devices shall have a Mean Time
403 Between Failure (MTBF) of 200,000 actuations.

404

405 All moving devices shall have a MTBF of 100,000 cycles.

406

407 Stationary Infantry presentation devices and ancillary devices shall be capable of performing a minimum of
408 30 actuations per minute, up to 1800 actuations per 24 hour operational day. It shall operate seven days or
409 more at the stated rate without requiring any maintenance actions to keep the device operational.

410

411 Stationary Armor presentation devices shall be capable of performing a minimum of 40 actuations per hour,
412 up to 300 actuations per 24 hour operational day. It will operate seven days or more at the stated rate
413 without requiring any maintenance actions to keep the presentation device operational.

414

415 Moving Infantry devices shall be capable of performing a minimum of 15 cycles per hour, up to 100 cycles
416 per 24 hour operational day without any required dedicated downtime for regeneration of the power supply.
417 It shall operate seven days or more at the stated rate without requiring any maintenance actions to keep the
418 device operational.

419

420 Moving Armor devices shall be capable of performing a minimum of 8 cycles per hour, up to 100 cycles per
421 24 hour operational day. It shall operate seven days or more at the stated rate without requiring any
422 maintenance actions to keep the device operational.

423

424 Portable power (i.e., battery, fuel cell, etc.) shall have sufficient storage and regeneration capacity to execute
425 actuations per 20 hour training event.

426

427 Devices shall be capable of sustaining being stepped on, overpressure caused by passing munitions and
428 vibrations caused by nearby tactical vehicles. Presentation Devices are not required to withstand direct hits
429 from direct fire weapons, but must withstand impacts from ground-to-ground indirect- fire training (non-
430 explosive) munitions up to 40mm that are authorized to be used on non-duded impact area IAW DA Pam
431 385-63.

432

433 Infantry E and F type 2D (flat) and 2 ½D (2D with depth), and 3D (mannequin like) silhouettes will sustain
434 a minimum of 2000 hits from 7.62 mm.

435

UNCLASSIFIED DRAFT

436 Infantry thermal targets will be able to maintain their realistic visual, I2 (Image Intensification), and thermal
437 appearance when hit by a minimum of 1600 rounds of all combinations of 5.56mm, 7.62mm, and similar
438 caliber munitions.

439
440 Flank vehicle thermal targets shall be able to maintain their realistic visual, I2, and thermal appearance
441 when hit by a minimum of 16 120mm and 105mm training sabot and HEAT rounds, and a minimum of all
442 combinations of 250 rounds of 25mm, 30mm, and .50 caliber munitions.

443
444 Frontal vehicle thermal targets shall be able to maintain their realistic visual, I2, and thermal appearance
445 when hit by a minimum of eight 120mm and 105mm training sabot and HEAT rounds, and a minimum of
446 all combinations of 125 rounds of 25mm, 30mm, and .50 caliber.

447
448 Production Objective: FASIT devices shall have a minimum mean time between failures of 250,000
449 actuations. In addition, moving presentation devices shall have a minimum mean time between failures of
450 150,000 movements (round trip).

451
452 Armor presentation devices shall be capable of performing a minimum of 50 actuations per hour, up to 400
453 actuations per 24 hour operational day without any required dedicated downtime for regeneration of the
454 power supply. It will operate seven days or more at the stated rate without requiring any maintenance
455 actions to keep the presentation device operational.

456
457 Moving Infantry devices shall be capable of performing a minimum of 30 cycles per hour, up to 200 cycles
458 per 24 hour operational day without any required dedicated downtime for regeneration of the power supply.
459 It shall operate seven days or more at the stated rate without requiring any maintenance actions to keep the
460 device operational.

461
462 Moving Armor devices shall be capable of performing a minimum of 15 cycles per hour, up to 200 cycles
463 per 24 hour operational day. It shall operate seven days or more at the stated rate without requiring any
464 maintenance actions to keep the device operational.

465
466 Presentation Devices are not required to withstand direct hits from direct fire weapons, but must withstand
467 impacts from any ground-to-ground or air-to-ground indirect fire training munitions up to 120mm that are
468 authorized to be used on non-duded impact area IAW DA Pam 385-63.

469
470 *Rationale:* FASIT shall meet materiel availability standards to provide training capability expected by the
471 end user. To reduce the logistics footprint FASIT shall maintain a capability of enduring extensive usage on
472 fixed and mobile sites. Data from ASA(ALT) indicate that targetry maintains operational availability over a
473 20-year life span. Targetry is used on lane-based or objective-based facilities. When a target mechanism
474 fails on a lane based weapons qualification range it will cause an entire lane to be unusable but will not
475 affect other lanes. The average number of lanes on an individual weapons qualification range is 14. If one
476 target fails on a lane the availability of the lanes would be 94%. The average number of targets on an
477 individual weapons qualification range is 128 targets. If one target fails on a range (the device), the
478 availability of all the targets on a range would be 99.3%. The materiel availability metric is thus expressed
479 as the percentage of firing lanes and total targets available for training for is $x\%$ lane availability \times $x\%$
480 target availability at EUL ($94\% \times 99.3\% = 93.3\%$ or approximately 93% at 20 years). When a targetry
481 system fails on some objective based crew qualification range, alternate targets may be designated and will

UNCLASSIFIED DRAFT

482 not cause an entire objective to fail.

483

484 5.1.4.3 (U) Sustainment Reliability KSA

485 Production Threshold: All FASIT devices shall have a reliability of at least 98%. (probability of mission
486 success without interruption or failure) for a mission duration of 20 days with 2 days of recovery allocated
487 after 10 days; supporting training periods of 20 hours with 2 hours reset after 10 hours. Before FASIT
488 reaches FOC, the system shall have the capability to log cycles/actuators to determine service life in the
489 future.

490

491 Production Objective: All FASIT devices/hardware shall have a reliability of at least 99% (probability of
492 mission success without interruption or failure) for a mission duration of 35 days; supporting training
493 periods of 22-hours; 15-days of continuous operation with 1-days of recovery over a device service life of
494 no less than 30 years. Service life shall be determined based on cycles/actuators and weapons effects on
495 devices (i.e., small caliber range or large caliber range).

496

497 *Rationale:* FASIT shall meet device/hardware reliability standards to provide training capability expected by
498 the end user. The reliability metric is to measure the probability the inventory shall perform without failure
499 over a specific time period. Reliability metric is equal to the requirements of current Army target systems.
500 Mission metrics are equal to current TC 25-8 (Training Ranges). At start of IOC, the PM shall begin to
501 collect data on service life of all targetry systems based on cycles (instead of years) to promote cost
502 avoidance.

503

504 5.1.4.4 (U) Operating and Support Costs KSA (Not Included/FOUO)

505

506 5.1.5 (U) Training

507 Production Threshold: Training proficiency shall be completed during an eight-hour block of training for
508 each position, operator (8-hours) and maintainer (8-hours). Shall have ability to conduct robust, scalable,
509 flexible, and mobile training. Training shall be made available via onsite New Equipment Training (NET),
510 Distributed Learning, and through applicable Programs of Instruction (POI) Training Support Packages
511 (TSP). In order to maintain proficiency level and training retention the PM shall provide each range a copy
512 of current TSPs, Sharable Content Object Reference Model (SCORM) compliant Interactive Multimedia
513 Instruction (IMI) on CD-ROM/DVD-ROM, 14&P technical manuals for each FASIT asset. FASIT
514 components shall not be required to be maintained by Soldiers. FASIT component and operating system
515 shall be operated by Soldiers. All upgrades to components and operating system will be staffed by TCM
516 Ranges.

517

518 Production Objective: Training proficiency shall be completed during a four-hour block of training for each,
519 operator and maintainer. FASIT shall make use of built-in job/memory aids to assist Soldiers in performing
520 critical tasks and reducing refresher training requirements. FASIT components and operator/maintainer
521 interfaces shall, when feasible, also provide built-in task performance feedback to enhance skill retention.
522 FASIT shall leverage aspects of the operator/maintainer interface common to legacy systems that are similar
523 in function in order to lessen the training burden during fielding

524

525 *Rationale:* Training of the FASIT system is essential to maximize the full extent of training capabilities.
526 The PM shall coordinate with TCM Ranges and incorporate the principal attributes of training which are
527 Proficiency Level, Time to Train, Training Retention, Training Support, and Training Interoperability. Use

UNCLASSIFIED DRAFT

528 of the most current training capabilities to develop embedded system training for operators and maintainers
529 shall be required to increase system performance and better mitigate cost growth over the life cycle of the
530 system. Comprehensive training, available on stationary and portable devices (such as workstations,
531 laptops, etc.), is essential for proper operation of the system to increase proficiency levels, decrease the time
532 needed for training while maintaining proficiency. FASIT shall facilitate operator and maintainer task
533 proficiency and skill retention by incorporating trainability considerations in all aspects of system design.
534

535 5.1.6 (U) Energy

536 Production Threshold: Production Threshold: FASIT shall integrate, manage, and distribute power from
537 self-contained (Direct Current-DC) and worldwide standard shore power sources (Alternate Current-AC) for
538 CONUS and OCONUS ranges. AC powered devices shall utilize locally available voltage and
539 accommodate 120/240VAC single phase +/- 5% for both 50 & 60 Hz applications. Uses of batteries are
540 only allowed to be used to supplement the power of the movers while away from the docking station. DC
541 powered devices shall be powered via batteries, fuel cells, etc. to power ranges or devices when main power
542 is not used. Regeneration devices (solar panels, fuel cells, etc) shall be available options to regenerate the
543 DC power devices. If generators are required the PM shall coordinate with host site to ensure the generators
544 provide 120/240 volts, single phase for CONUS and OCONUS installations; total maximum power demand
545 shall be less than 90% of facilities rated power capacity; preventive maintenance held to minimum with
546 Mean Time to Repair (MTTR) Not to Exceed (NTE) 8 hours; Ao: 98% of range operational time. In case of
547 power loss shall have capability to allow 30-minutes before computer shutdown.
548

549 Production Objective: Production Objective: FASIT shall Integrate, manage, and distribute power from
550 self-contained and worldwide standard shore power sources. Self-contained power capability shall be
551 available if configured for portable or deployable operations. System power shall allow for operating
552 periods up to seven days without maintenance or replacement. In case of power loss shall have capability to
553 sustain operations for minimum of 30-minutes while continuing computer processor operations. Shall allow
554 to selectively power-up / power-down any component configured in scenario. Total maximum power
555 demand shall be within 90-100% of rated power capacity; preventive maintenance held to minimum with
556 MTTR NTE 8 hours; Ao: 99% of range operational time. Presentation devices shall be able to interface
557 with tactical systems for power. Use of alternative power sources as developed in the future.
558

559 Rationale: System Power for FASIT is essential to support training. Interface with Government Furnished
560 Equipment (GFE) power supplied on standard US Army ranges allow for uninterrupted power. Capability
561 is further enhanced by working with, and managing provided, or inherent power capabilities in order to
562 work where and when needed for training.
563

564 5.2 (U) Additional KPPs, KSAs, or Attribute

566 5.2.1 (U) KPP 1 – Logistical Support

567 Production Threshold: FASIT shall provide requirements to allow for organic (installation) and contractor
568 logistical support systems, and assignment of Item Managers to manage spare parts and other logistics
569 issues. Provisioning of spare parts shall be executed through the Army Supply System (i.e., Army Materiel
570 Command) to include assignment of item managers. Contract performance specifications must include
571 provisions to provide Management Control Numbers and applicable CAGE codes for readiness
572 package/spares to the Government. PM shall ensure Operational Readiness (OR) can be maintained in a
573 quick and low cost manner to ensure each fielded FASIT maintains a 98% OR rate. When FASIT is a

UNCLASSIFIED DRAFT

574 subsystem to a larger system supported by Life Cycle Contractor Support (LCCS), then support of FASIT
575 shall be by LCCS, however, uniform overarching maintenance procedures shall be prescribed by the
576 government. FASIT shall capitalize on lessons learned by continuing to utilize commercial systems; remain
577 cost effective through competition; allow for innovations from industry. PM shall track usage data (cycles,
578 actuations, and training environment) of targetry to provide data to assist in recapitalization decisions.
579

580 Production Objective: The PM shall provide provisions for parts procurement/provisioning and shall include
581 management of those parts to ensure OR can be maintained to ensure each fielded FASIT maintains a 99%
582 OR rate.
583

584 *Rationale:* Current and previous target initiatives provided partial successes that addressed logistics, but did
585 not totally fulfill the requirements of sustainers and maintainers. Life cycle logistics continue to be a large
586 cost driver for any Army program. FASIT design shall allow for cost savings by maximizing the
587 commonality, interoperability and scalability among interface of all FASIT components.
588

589 5.2.2 (U) KPP 2 – Targetry System

590 Production Threshold:

591 Presentation Devices (PD):

- 592 • All automated PD's shall respond to commands from the Control System.
- 593 • PD shall have the ability to present, conceal, and/or provide visual indication of successful engagement.
- 594 • All PDs shall ensure stable presentation of target and ability to fulfill exposure requirements.
- 595 • The PD shall be capable of presenting at least 90% (doctrinal height) of Infantry targets and 100% of
596 vehicle target above the berm while protecting the target lifting mechanism and sensors.
- 597 • A moving PD shall be capable of moving along various terrain on the surface, or rails, and provides
598 status with respect to location and velocity
- 599 • Move to position, switch direction on hit, synchronized target exposure and movement.
- 600 • Human-type targets (HTT) shall be 3-D representation of a full-size adult (64-70")
- 601 • The PD shall provide non-automated target representations that do not require range infrastructure.
- 602 • The PD shall provide electric target systems (i.e., powered, radio controlled (RF/WiFi)) that do not
603 require range infrastructure other than target protection.
- 604 • All powered targets shall have capability to support thermal/non-thermal multi-dimensional signatures.
- 605 • All targetry shall interface with the requirements and facilities published in the USACE Range Design
606 Guide.
- 607 .

608 Hit Sensing:

- 609 • Target shall collect and record each round fired up to 10 rounds per second, with accuracy of 99%.
- 610 • Target system shall record and time tag hits.
- 611 • Target system shall record and time tag hit and miss location of round on target information.
- 612 • FASIT shall provide for hit sensing of engagements for relevant feedback; to include, likelihood of
613 engagement having lethal/non-lethal impact with 100% accuracy.
- 614 • Hit sensing shall not generate false hits caused by the actuation of the lifter.
- 615 • Hit detection shall be such that at least 97% of the rounds that penetrate the target, or scoreable area,
616 shall be scored as a hit or impact in the target effect area (TEA) IAW appropriate
617 task/condition/standard.
- 618 • Hit detection shall detect and record the presence of hits at any rate up to 10 rounds per second.
- 619 • The hit detection shall be capable of sensitivity adjustment to allow for hit detection thresholds based on

UNCLASSIFIED DRAFT

- 620 caliber and number of hits detected.
- 621 • Hit sensing kill zones shall be adjustable, and support multiple kill zones for vehicle targets (i.e.
- 622 catastrophic, mobility, communication).
- 623 • HTTs shall differentiate between lethal and non-lethal zones. HTT non-lethal zones shall have ability to
- 624 configure number of hits to record a kill.
- 625 • Hit Sensing shall not score objects other than fired rounds, such as ricochets.
- 626 • Hit Sensing shall be time tagged in scenario.
- 627 • Hit detection shall be able to provide hit location information with an accuracy not to exceed the width
- 628 of the caliber of round fired.
- 629 • Target system shall record how many cumulative hits taken for any user inputted time period and life of
- 630 the target.

631

632 Production Objective:

633 Presentation Devices (PD)

- 634 • Realistic personnel/vehicle targets shall have capability to be presented as millimeter wave (MMW).
- 635 • Live-fire augmented reality threat, neutral and friendly presentations overlaid over firing area (range
- 636 footprint and impact area). Realistic offensive and defensive postures and battle damage.
- 637 • The PD shall be capable of presenting 100% (doctrinal height) of Infantry targets above the berm while
- 638 protecting the target lifting mechanism and sensors.
- 639 • The PD shall have ability for target to be presented as an autonomous trackless target. Targets shall be
- 640 multi-dimensional (i.e. 3D, realistic visual and thermal images) and provide hit locations, provide real-
- 641 time position location, and built-in controls to prevent target from leaving the surface danger zone.
- 642 Scenarios shall be TRACR-based and allow for simple (2-way and closed pattern loops) to complex
- 643 movements (way points and autonomous behavior) based on engagement type. Targets shall provide
- 644 real time position location and built-in controls to prevent target from leaving the ranges surface danger
- 645 zone.
- 646 • FASIT shall provide a PD for a moving frontal, flank, and oblique maritime target, sustaining up to
- 647 30mm for surface-to-surface and air-to-surface engagements, and laser (i.e., support captive
- 648 Hellfire/JAGM) for air-to-surface engagements. Targets must support engagement by manned and
- 649 unmanned aerial platforms. Targets must be capable of 30KTS in Sea State 2, provide an acceptable
- 650 FLIR/radar signature and are not required to be longer than 13 meters.
- 651 • Target system shall record and time tag position location of participating weapons and targets.

652

653 Hit Sensing

- 654 • Hit Sensing shall identify the type of round engaging a target to ensure maximum training value with
- 655 99% accuracy.
- 656 • Target system shall detect, score, and record area weapons hits (i.e. MK-19, M203/M230) up to 15
- 657 meters.
- 658 • Hit Sensing shall be such that at least 99% of the rounds that penetrate the target, or scoreable kill area,
- 659 shall be scored as a hit.
- 660 • Hit Sensing shall identify when a target has been engaged by more than one type of round with 99%
- 661 accuracy.
- 662 • Targets shall be capable of supporting directed energy/ laser training weapons/systems.
- 663 • Augmented reality/virtual targets shall react to live fire hits and present battle damage.
- 664 • Laser sensing shall capture and score precision laser on 1D and 3D targets with 97% accuracy.
- 665 Missile/laser engagements take place from all aspects (i.e., top down for UAS).

UNCLASSIFIED DRAFT

666

667 *Rationale:* The FASIT targetry systems include the presentation device and hit sensing:

668 **Presentation Device (PD)** – PDs shall have ability to interface with targets as dictated by given scenario;
669 present representation of targets required to stimulate users in the process of acquiring, aiming, and firing
670 weapons in a live-training environment.

671 **Hit Sensing** - Providing accurate Force-on-Target feedback to individuals and crews shall enhance
672 proficiency for individual through collective tasks. Use of hit/miss detection has been proven to reduce
673 training time and increase throughput capabilities, making for more effective and efficient training events,
674 while saving vital resources.

675

676 5.2.3 (U) KPP 3 – Control System

677 Production Threshold:

678 **Target Control (TC):**

- 679 • In order to maintain flexibility required to meet doctrinal standards for qualification and training, targets
680 shall be portable; and range scenarios shall have the ability to be created, changed, saved, and prepared
681 to execute training events using GOTS software.
- 682 • All control systems shall consist of GOTS software and be registered in the Army Portfolio
683 Management System (APMS).
- 684 • System shall include up to 120 previously created, doctrinally-based, and saved scenarios, for each
685 range type. User shall have the ability to generate/modify selected scenarios within range and/or
686 targetry limitations.
- 687 • Target systems shall be transportable using organic assets.
- 688 • FASIT shall provide ability to configure targetry system and component settings for training event
689 defined by range parameters; maintain at least one set of parameters for each scenario; initiate and/or
690 control event-based or time-based actions within a scenario.
- 691 • System shall be initialized for use in less than ten minutes, to include performing verification tests to
692 verify configuration and initialize for training event.
- 693 • FASIT shall provide mobile remote-control for use on designated range.
- 694 • System shall be capable of software updates through Government Cloud via cellular network.

695 **After Action Review (AAR):**

- 696 • Shall provide specified training feedback of data, audio, and video collected during training event
697 activities.
- 698 • AAR capability shall record both, audio and video imagery (range cameras and thru site video),
699 appropriate to the scope of range capabilities from the perspective of an observer/controller trainer or
700 crew evaluator.
- 701 • System shall be able to record training and provide unit trend data.
- 702 • Data and information collected from training shall be capable of being edited for presentation and
703 provided in the form of improved AARs and take home packages.
- 704 • Score sheets shall be current with applicable doctrine.
- 705 • Shall provide data to update individual training records through DTMS to provide individual scorecards
706 and team/collective score sheets.

707

708 Production Objective:

709 **TC:**

- 710 • User shall have ability to select from list of up to 150 saved scenario engagements, and maintain at least
711 five sets of parameters for each scenario.

UNCLASSIFIED DRAFT

- 712 • System shall be initialized for use in less than five minutes.
713 • Target systems shall be capable of interfacing with embedded tactical systems for target control.
714

AAR:

- 715
716 • Shall provide an update of individual training records to provide individual scorecards and
717 team/collective score sheets.
718 • FASIT shall provide and receive data to and from T-IS as defined by the governing LT2 ICDs and
719 Standards.
720 • Target systems shall be capable of interfacing with embedded tactical systems to support AARs.
721 • AAR capabilities shall include Soldier mounted audio and video recording devices.
722

723 **LVC IA interface:** digital information entering and leaving range footprint shall go through an
724 instrumentation system such as T-IS, CTC-IS, and DRTS.
725

726 *Rationale:* The FASIT control system includes the Target Control and After Action Review capabilities:

727 **Target Control (TC):** As the complexity of the range environment moves toward an information
728 management network, the capability to prepare and configure components shall become essential.
729 Controlling targetry shall ultimately result in reduced training costs by increasing training throughput.

730 **After Action Review (AAR) capabilities:** The ability to provide operators, support personnel and
731 evaluators the tools to control the exercise to meet objectives; conduct data collection, management, and
732 analysis; and updating of training records is necessary to provide effective feedback utilizing LT2 standards.
733 Digital data is a necessary component of the AAR for advanced operational environment systems. As a
734 training enabler, it is imperative for training results to be made available for the unit to conduct AARs.
735 System architecture shall support access to unit training records for use in AAR discussions.
736

5.2.4 (U) KSA 1 - Battlefield/Weapon Effects System

738 Production Threshold: Pyrotechnics shall be detectable by un-instrumented human eye visible spectrum up
739 to 3000m day; in IR spectrum up to 6000m day/night and generate another effect within 5-seconds.

740 FASIT shall provide selectable and realistic audio effects for additional stimulation to include; human
741 speech, animals, various threat/friendly vehicle/weapon sounds. Unit actions are constantly evolving during
742 training events, therefore, system shall have the ability to rapidly change audio/visual/digital effects and
743 replicate like-effects during the training event. FASIT shall include Night Muzzle Flash Simulator effects.
744 Shall enable training facilities to accurately reflect doctrinal and COE conditions and threats by stimulating
745 Army, Joint & Coalition Combat ID Sensors. FASIT shall be able to control and activate nondescript
746 battlefield effects using unassigned command lines and connected through an auxiliary port of the target.
747

748 Production Objective: Flash simulator may replicate caliber and range of various weapon systems.
749 Olfactory stimulations shall be realistic battlefield smells. FASIT shall include capability to emit a threat
750 ground-to-ground signal (laser, radar) to a ground or aerial system. Threat emitter shall be located
751 downrange within the range fan and integrated with a threat target for ground-to-ground/ground-to-air
752 battlefield effects. Emitter shall be activated by the range operating system as a manual step. Shall include
753 capability to emit a friendly signal (laser, radar) to a ground or aerial system. Integrate aerial and ground
754 systems cooperative target identification. Capability to emit a friendly signal (laser, radar) to a ground or
755 aerial system. Friendly emitter shall be located downrange within the range fan and integrated with a
756 friendly target. Classified friendly emitters shall be standalone and not be integrated with the range
757 operating system or range network.

UNCLASSIFIED DRAFT

758 To further enhance situational awareness, ranges shall incorporate a Cooperative Target Identification
759 (CTI), or like-solution, to live fire ranges & facilities that shall stimulate Soldiers and platforms of the
760 presence of friendly forces in their battle space in accordance with Combat Identification (CID) DCR, 3 July
761 2007. Shall have capability to produce various colors of smoke from multiple sources, to include Surface-
762 to-Air missiles, and sustain for up to 5-minutes after initiation to replicate weapon effects.
763 FASIT shall include capability to emit a threat ground-to-air signal (laser, radar) to an Army air system.
764 Threat emitter shall be located downrange within the range fan and integrated with a threat target for
765 ground-to-ground battlefield effects. Emitter shall be activated by the range operating system as a manual
766 step. FASIT shall include carriers that can transport and execute battlefield effects on different parts of the
767 range based on the scenario as a stand-alone system that is not connected to a target.
768

769 *Rationale:* Realistic battlefield effects create a training experience on the range environment to promote
770 realism experienced in actual combat conditions. Such realism increases the value of training and reduces
771 the gap between training and actual combat experiences. Battlefield effects stimulate Soldiers to conditions
772 on the battlefield such as, pyrotechnic, smoke, sounds, threat system stimulations (i.e. radar) and other fog
773 of war conditions. Weapon's effects provide Soldiers with engagement stimulations as appropriate, such
774 muzzle flash and steel-on-steel signatures. In addition, opposing forces possess IR and radar guided weapon
775 systems that are not replicated on current ranges. The replication of these weapon systems would allow
776 training and evaluation of crew response when facing an anti-aircraft or ground threat.
777

778 5.2.5 (U) KSA#2 – Targetry System Network

779 Production Threshold: System architecture shall provide improvements on the range environment that
780 decrease the gap between operational environment and training experiences through its ability to manage
781 data and information. Establish and maintain communication connectivity 98% of the time, independent of
782 location and media. Shall provide ability for multimedia digital transfers between user selectable nodes of
783 range; frequency bands commensurate with emission bandwidth; power required to meet system data
784 transfer and range requirements. Network devices, cabling, and connectors shall be compatible with
785 established standards to reduce logistics burden of maintaining system. Combination of wire and wireless
786 media, including simultaneous operations, where commands using one method of communication are passed
787 to the other in order to complete scenario. Network management to include full spectrum of measures
788 needed to execute range training, from planning to training feedback. Utilize less than 10% of the available
789 bandwidth. Minimize effects of emissions and co-site interference between two or more adjacent nodes.
790 Transfer device configuration data to any node within network. Monitor status of network devices and
791 network condition, report changes in status, and respond to individual device and overall network changes.
792 Security services and mechanisms for authentication, integrity, auditing, and access control IAW DIACAP.
793 Ability to add one or more nodes to existing range network. Training Network shall be compatible with
794 local wiring standard (for legacy and current wired infrastructure) or local frequency availability (for
795 wireless target systems).
796

797 Production Objective: Network shall establish and maintain communication connectivity 99% of the time,
798 independent of location and media. FASIT shall have ability to operate in tactical electronic
799 countermeasures environment. Fault management of system shall detect and notify; identify and diagnose
800 problems in performance and configuration; recommend solutions, and manage/track faults until corrected.
801 Data logging capability shall support troubleshooting and performance feedback.
802

803 *Rationale:* FASIT is a networked system. The targets, ancillary devices, control, and AAR systems are

UNCLASSIFIED DRAFT

804 interconnected by their own wired/ wireless network which can operate as a standalone system without
 805 requiring any footprint dependencies outside of the range, except for power, to support live-fire training
 806 requirements to Soldiers and Commanders. Multiple ranges may be interconnected if the infrastructure is
 807 present. If required, FASIT has the capability to support network interoperability which allow commanders
 808 to leverage the capabilities of the environments within LVC training (through higher level instrumentation
 809 system, when available) while achieving the desired end-state of Force-on-Target training. This will allow
 810 Commanders to integrate leaders and units that may not be in the local area into an exercise without needing
 811 entire unit in the live training environment. This capability shall have a positive impact on unit training
 812 funds by reducing the costs associated with logistics support required to attend training events.

5.3 (U) KPP/KSA/Other Attributes Rollup

JCA	Key Performance Parameter		Production Threshold	Production Objective
1. Force Support 1.2 Force Preparation 3. Force Application 3.2 Engagement	Sustainment		<p>All FASIT devices shall meet requirements listed in most recently approved Performance Specification.</p> <p>FASIT shall have ability to track usage and performance history of the system to validate and monitor availability and reliability data of individual targets and the system as a whole. This will provide data to predict when system replacement/recapitalization is required.</p>	<p>All FASIT devices shall exceed requirements listed in most recently approved Performance Specification.</p> <p>System shall have ability to predict future device/hardware failures based on historical maintenance records.</p>
	Sustainment	1-Operational Availability	<p>All FASIT devices shall provide a 94 percent operational availability for continuous operation on military ranges operating 24 hours per day with at least 99% (probability of mission success without interruption or failure) for a mission duration of 20 days. 24 hour day=20 hours continuous operation per day with 2 hours break for maintenance allocated every 10 hours. 20 day mission duration=10 continuous days with 2 days allocated for reset between each</p>	<p>All FASIT devices shall provide a 99 percent operational availability for continuous operation on military ranges operating 24 hours per day with at least 99% (probability of mission success without interruption or failure) for a mission duration of 30 days. 24 hour day=22 hours continuous operation per day with 1 hour break for maintenance allocated every 11 hours. 30 day mission duration=14 continuous days with 1 day</p>

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter		Production Threshold	Production Objective
		<p>2-Sustainment Materiel Availability</p>	<p>cycle.</p> <p>All stationary presentation devices and ancillary devices shall have MTBF of 200,000 actuations.</p> <p>All moving devices shall have a MTBF of 100,000 cycles.</p> <p>Stationary Infantry presentation devices and ancillary devices shall be capable of performing a minimum of 60 actuations per hour, up to 1200 actuations per 24 hour operational day. It shall operate seven days or more at the stated rate without requiring any maintenance actions to keep the device operational.</p> <p>Stationary Armor presentation devices shall be capable of performing a minimum of 40 actuations per hour, up to 300 actuations per 24 hour operational day. It will operate seven days or more at the stated rate without requiring any maintenance actions to keep the presentation device operational.</p> <p>Moving Infantry devices shall be capable of performing a minimum of 15 cycles per hour, up to 100 cycles per 24 hour operational day without any required dedicated downtime for regeneration of the power supply. It shall operate seven days or more at the stated rate</p>	<p>allocated for reset between each cycle.</p> <p>Infantry presentation devices and ancillary devices will be capable of performing a minimum of 30 actuations per minute, up to 1800 actuations per 24 hour operational day. It will operate seven days or more at the stated rate without requiring any maintenance actions to keep the presentation device operational.</p> <p>Armor presentation devices shall be capable of performing a minimum of 50 actuations per hour, up to 400 actuations per 24 hour operational day without any required dedicated downtime for regeneration of the power supply. It will operate seven days or more at the stated rate without requiring any maintenance actions to keep the presentation device operational.</p> <p>Moving Infantry devices shall be capable of performing a minimum of 30 cycles per hour, up to 200 cycles per 24 hour operational day without any required dedicated downtime for regeneration of the power supply. It shall operate seven days or more at the stated</p>

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>without requiring any maintenance actions to keep the device operational.</p> <p>Moving Armor devices shall be capable of performing a minimum of 8 cycles per hour, up to 100 cycles per 24 hour operational day. It shall operate seven days or more at the stated rate without requiring any maintenance actions to keep the device operational.</p> <p>For ranges/target positions without fixed power (i.e., battery, fuel cell, etc.) 150 actuations of uniform distribution across an 8 hour period, and will have sufficient storage and regeneration capacity to execute actuations at a maximum rate of 20 per hour.</p> <p>Devices shall be capable of sustaining being stepped on, overpressure caused by passing munitions and vibrations caused by nearby tactical vehicles. Presentation Devices are not required to withstand direct hits from direct fire weapons, but must withstand impacts from ground-to-ground indirect- fire training (non-explosive) munitions up to 40mm that are authorized to be used on non-duded impact area IAW DA Pam 385-63.</p> <p>Infantry E and F type 2D (flat) and 2 ½D (2D with depth), and 3D (mannequin like) silhouettes will sustain a minimum of 2000</p>	<p>rate without requiring any maintenance actions to keep the device operational.</p> <p>Moving Armor devices shall be capable of performing a minimum of 15 cycles per hour, up to 200 cycles per 24 hour operational day. It shall operate seven days or more at the stated rate without requiring any maintenance actions to keep the device operational.</p> <p>For ranges/target positions without fixed power (ie battery, fuel cell, etc) 150 actuations of uniform distribution across an 8 hour period, and will have sufficient storage and regeneration capacity to execute actuations at a maximum rate of 20 per hour.</p> <p>FASIT devices shall have a minimum mean time between failures of 200,000 actuations. In addition, moving presentation devices shall have a minimum mean time between failures of 100,000 movements (round trip).</p> <p>Presentation Devices are not required to withstand direct hits from direct fire weapons, but must withstand impacts from any ground-to-ground or air-to-ground indirect- fire training munitions that are</p>

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>hits from 7.62 mm.</p> <p>Infantry thermal targets will be able to maintain their realistic visual, I2 (Image Intensification), and thermal appearance when hit by a minimum of 1600 rounds of all combinations of 5.56mm, 7.62mm, and similar caliber munitions.</p> <p>Flank vehicle thermal targets shall be able to maintain their realistic visual, I2, and thermal appearance when hit by a minimum of 16 120mm and 105mm training sabot and HEAT rounds, and a minimum of all combinations of 250 rounds of 25mm, 30mm, and .50 caliber munitions.</p> <p>Frontal vehicle thermal targets shall be able to maintain their realistic visual, I2, and thermal appearance when hit by a minimum of eight 120mm and 105mm training sabot and HEAT rounds, and a minimum of all combinations of 125 rounds of 25mm, 30mm, and .50 caliber.</p>	<p>authorized to be used on non-dusted impact area IAW DA Pam 385-63.</p>
<p>1. Force Support 1.2 Force Preparation</p>	<p>Training</p>	<ul style="list-style-type: none"> • Training proficiency shall be completed during an eight-hour block of training for each position, operator (8-hours) and maintainer (8-hours). • Shall have ability to conduct robust, scalable, flexible, and mobile 	<ul style="list-style-type: none"> • Training proficiency shall be completed during a four-hour block of training for each, operator and maintainer. • FASIT shall make use of built-in job/memory aids to assist Soldiers in performing critical tasks and reducing refresher

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>training.</p> <ul style="list-style-type: none"> • Training shall be made available via onsite New Equipment Training (NET), Distance Learning, and through applicable Programs of Instruction (POI). • In order to maintain proficiency level and training retention the PM shall provide each range a copy of current TSPs, Sharable Content Object Reference Model (SCORM) compliant Interactive Multimedia Instruction (IMI) on CD-ROM/DVD-ROM, 14&P technical manuals for each FASIT asset. • FASIT components shall not be required to be maintained by Soldiers. • FASIT component and operating system shall be operated by Soldiers. All upgrades to components and operating system will be staffed by TCM Ranges. 	<p>training requirements.</p> <ul style="list-style-type: none"> • FASIT components and operator/maintainer interfaces shall, when feasible, also provide built-in task performance feedback to enhance skill retention. • FASIT shall leverage aspects of the operator/maintainer interface common to legacy systems that are similar in function in order to lessen the training burden during fielding
<p>1. Force Support 1.2 Force Preparation</p>	<p>Energy</p>	<ul style="list-style-type: none"> • FASIT shall integrate, manage, and distribute power from self-contained (Direct Current-DC) and worldwide standard shore power sources (Alternate Current-AC) for CONUS and OCONUS ranges. • AC powered devices shall utilize locally available voltage and accommodate 120/240VAC single phase 	<ul style="list-style-type: none"> • FASIT shall Integrate, manage, and distribute power from self-contained and worldwide standard shore power sources. • Self-contained power capability shall be available if configured for portable or deployable operations. • System power shall allow

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>+/- 5% for both 50 & 60 Hz applications. Uses of batteries are only allowed to be used to supplement the power of the movers while away from the docking station.</p> <ul style="list-style-type: none"> • DC powered devices shall be powered via batteries, generators, fuel cells, etc. to power ranges or devices when main power unavailable. • Regeneration devices (solar panels, generators, etc) shall be available options to regenerate the DC power devices. • Generators shall provide 120/240 volts, single phase for CONUS and OCONUS installations; total maximum power demand shall be less than 90% of facilities rated power capacity; preventive maintenance held to minimum with Mean Time to Repair (MTTR) Not to Exceed (NTE) 8 hours; Ao: 98% of range operational time. 	<p>for operating periods up to seven days without maintenance or replacement.</p> <ul style="list-style-type: none"> • In case of power loss shall have capability to sustain operations for minimum of 30-minutes while continuing computer processor operations. • Shall allow for selectively power-up / power-down of any component configured in scenario. • Total maximum power demand shall be within 90-100% of rated power capacity; preventive maintenance held to minimum with MTTR NTE 8 hours; Ao: 99% of range operational time. • Presentation devices shall be able to interface with tactical systems for power. <p>Use of alternative power sources as developed in the future.</p>
<p>1. Force Support 1.2 Force Preparation 4. Logistics 4.7 Base & Installation Support</p>	<p>KPP 1 – Logistical Support</p>	<p>FASIT shall provide requirements to allow for organic (installation) and contractor logistical support systems, and assignment of Item Managers to manage spare parts and other logistics issues. Provisioning of spare parts shall be executed through the Army Supply System (i.e., Army Materiel Command) to include assignment of item managers. Contract performance</p>	<p>The PM shall provide provisions for parts procurement/provisioning and shall include management of those parts to ensure OR can be maintained to ensure each fielded FASIT maintains a 99% OR rate.</p>

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>specifications must include provisions to provide Management Control Numbers and applicable CAGE codes for readiness package/spares to the Government. PM shall ensure Operational Readiness (OR) can be maintained in a quick and low cost manner to ensure each fielded FASIT maintains a 98% OR rate. When FASIT is a subsystem to a larger system supported by Life Cycle Contractor Support (LCCS), then support of FASIT shall be by LCCS, however, uniform overarching maintenance procedures shall be prescribed by the government. FASIT shall capitalize on lessons learned by continuing to utilize commercial systems; remain cost effective through competition; allow for innovations from industry. PM shall track usage data (cycles, actuations, and training environment) of targetry to provide data to assist in recapitalization decisions.</p>	
<p>1. Force Support 1.2 Force Preparation 4. Logistics 4.7 Base & Installation Support</p>	<p>KPP #2 – Target System</p> <ul style="list-style-type: none"> • Presentation Devices • Hit Sensing 	<p>Presentation Devices:</p> <ul style="list-style-type: none"> • All automated PD’s shall respond to commands from the Control System. • PD shall have the ability to present, conceal, and/or provide visual indication of successful engagement. • All PDs shall ensure stable presentation of target and ability to fulfill exposure requirements. • The PD shall be capable of 	<p>Presentation Devices:</p> <ul style="list-style-type: none"> • Realistic personnel/vehicle targets shall have capability to be presented as MMW. • Live-fire augmented reality threat, neutral and friendly presentations overlaid over firing area (range footprint and impact area). Realistic offensive and defensive postures and battle

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>presenting at least 90% (40" height) of Infantry targets and 100% of vehicle target above the berm while protecting the target lifting mechanism and sensors.</p> <ul style="list-style-type: none"> • A moving PD shall be capable of moving along various terrain on the surface, or rails, and provides status with respect to location and velocity • Move to position, switch direction on hit, synchronized target exposure and movement. • Human-type targets (HTT) shall be 3-D representation of a full-size adult (64-70") • The PD shall provide non-automated target representations that are durable and do not require range infrastructure. • The PD shall provide electric target systems (i.e., powered, radio controlled (RF/WiFi)) that do not require range infrastructure other than target protection. • All powered targets shall have capability to support thermal/non-thermal multi-dimensional signatures. • All targetry shall interface with the requirements and facilities published in the USACE Range Design Guide. <p>Hit Sensing:</p> <ul style="list-style-type: none"> • Hit sensing determines how the target was hit, while hit 	<p>damage.</p> <ul style="list-style-type: none"> • The PD shall have ability for target to be presented as an autonomous trackless target. Targets shall be multi-dimensional (i.e. 3D, realistic visual and thermal images) and provide hit locations, provide real-time position location, and built-in controls to prevent target from leaving the surface danger zone. Scenarios shall be TRACR-based and allow for simple (2-way and closed pattern loops) to complex movements (way points and autonomous behavior) based on engagement type. Targets shall provide real time position location and built-in controls to prevent target from leaving the ranges surface danger zone. • FASIT shall provide a PD for a moving frontal, flank, and oblique maritime target, sustaining up to 30mm for surface-to-surface and air-to-surface engagements, and laser (i.e., support captive Hellfire/JAGM) for air-to-surface engagements. Targets must support engagement by manned and unmanned aerial

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>detection determines what hit target.</p> <ul style="list-style-type: none"> • Hit Sensing shall be capable of detecting up to 10 rounds per second, with accuracy of 99%. • Hit sensing shall detect, score, and record hits any time a portion of the target is hit from designated firing position, to include point and area weapons. • FASIT shall provide for hit sensing of engagements for relevant feedback; to include, likelihood of engagement having lethal/non-lethal impact with 100% accuracy. • Hit sensing shall not generate false hits caused by the actuation of the lifter. • Hit detection shall be such that at least 97% of the rounds that penetrate the target, or scoreable area, shall be scored as a hit or impact in the target effect area (TEA) IAW appropriate task/condition/standard. • Hit detection shall detect and record the presence of hits at any rate up to 10 rounds per second. • The hit detection shall be capable of sensitivity adjustment to allow for hit detection thresholds based on caliber and number of hits detected. • Hit sensing kill zones shall be adjustable, and support multiple kill zones for vehicle targets (i.e. catastrophic, mobility, 	<p>platforms. Targets must be capable of 30KTS in Sea State 2, provide an acceptable FLIR/radar signature and are not required to be longer than 13 meters.</p> <p>Hit Sensing:</p> <ul style="list-style-type: none"> • Hit Sensing shall identify the type of round engaging a target to ensure maximum training value with 99% accuracy. • Hit Sensing shall be such that at least 99% of the rounds that penetrate the target, or scoreable kill area, shall be scored as a hit. • Hit Sensing shall identify when a target has been engaged by more than one type of round with 99% accuracy. • Targets shall be capable of supporting directed energy/ laser training weapons/systems. • Augmented reality targets shall react to live fire hits onto virtual targets and present battle damage. • Laser sensing shall capture and score precision laser on 1D and 3D targets with 97% accuracy. Missile/laser engagements take place from all aspects (i.e., top down for UAS).

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>communication).</p> <ul style="list-style-type: none"> • HTTs shall differentiate between lethal and non-lethal zones. HTT non-lethal zones shall have ability to configure number of hits to record a kill. • Hit Sensing shall not score objects other than fired rounds, such as ricochets. • Hit Sensing shall be time tagged in scenario. • Hit detection shall be able to provide hit location information with an accuracy not to exceed the width of the caliber of round fired. 	
<p>1. Force Support 1.2 Force Preparation</p>	<p>KPP #3– Control System</p> <ul style="list-style-type: none"> • Target Control • After Action Review 	<p>TC:</p> <ul style="list-style-type: none"> • In order to maintain flexibility required to meet doctrinal standards for qualification and training, targets shall be portable; and range scenarios shall have the ability to be created, changed, saved, and prepared to execute training events using GOTS software. • All control systems shall consist of GOTS software and be registered in the Army Portfolio Management System (APMS). • System shall include up to 120 previously created, doctrinally-based, and saved scenarios, for each range type. User shall have the ability to generate/modify selected scenarios within range and/or targetry limitations. • Target systems shall be transportable using organic 	<p>TC:</p> <ul style="list-style-type: none"> • User shall have ability to select from list of up to 150 saved scenario engagements, and maintain at least five sets of parameters for each scenario. • System shall be initialized for use in less than five minutes. • Target systems shall be capable of interfacing with embedded tactical systems for target control. <p>AAR:</p> <ul style="list-style-type: none"> • Shall provide an update of individual training records through Digital Management Training System (DTMS) to provide individual scorecards and team/collective score sheets.

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>assets.</p> <ul style="list-style-type: none"> • FASIT shall provide ability to configure targetry system and component settings for training event defined by range parameters; maintain at least one set of parameters for each scenario; initiate and/or control event-based or time-based actions within a scenario. • System shall be initialized for use in less than ten minutes, to include performing verification tests to verify configuration and initialize for training event. • FASIT shall provide mobile remote-control for use on designated range. • System shall be capable of software updates through Government Cloud via cellular network. <p>AAR:</p> <ul style="list-style-type: none"> • Shall provide specified training feedback of data, audio, and video collected during training event activities. • AAR capability shall record both, audio and video imagery (range cameras and thru site video), appropriate to the scope of range capabilities from the perspective of an observer/controller trainer or crew evaluator. • System shall be able to record training and provide unit trend data. • Data and information collected from training shall 	<ul style="list-style-type: none"> • FASIT shall provide and receive data to and from T-IS as defined by the governing LT2 ICDs and Standards. • Target systems shall be capable of interfacing with embedded tactical systems to support AARs. • AAR capabilities shall include Soldier mounted audio and video recording devices. <p>LVC IA interface: digital information entering and leaving range footprint shall go through an instrumentation system such as T-IS, CTC-IS, and DRTS.</p>

UNCLASSIFIED DRAFT

JCA	Key Performance Parameter	Production Threshold	Production Objective
		<p>be capable of being edited for presentation and provided in the form of improved AARs and take home packages.</p> <ul style="list-style-type: none"> Score sheets shall be current with applicable doctrine. Shall provide data to update individual training records through DTMS to provide individual scorecards and team/collective score sheets. 	

816

JCA	Key System Attribute	Production Threshold	Production Objective
1. Force Support 1.2 Force Preparation 3. Force Application 3.2 Engagement	Sustainment Reliability	<p>All FASIT devices shall have a reliability of at least 98%. (probability of mission success without interruption or failure) for a mission duration of 20 days with 2 days of recovery allocated after 10 days; supporting training periods of 20 hours with 2 hours reset after 10 hours.</p> <p>Before FASIT reaches FOC, the system shall have the capability to log cycles/actuators to determine service life in the future.</p>	<p>All FASIT devices/hardware shall have a reliability of at least 99% (probability of mission success without interruption or failure) for a mission duration of 35 days; supporting training periods of 22-hours; 15-days of continuous operation with 1-days of recovery over a device service life of no less than 30 years.</p> <p>Service life shall be determined based on cycles/actuators and weapons effects on devices (i.e., small caliber range or large caliber range).</p>
1. Force Support 1.2 Force Preparation	Sustainment O&S Cost \$k (FY19-38) (BY15) (Not Included/FOUO)	O&M (Ops) O&M (Acq)	O&M (Ops) O&M (Acq)
1. Force Support 1.2 Force	KSA #1 – Battlefield/Weapon System Effects	<ul style="list-style-type: none"> Pyrotechnics shall be detectable by un-instrumented human eye 	<ul style="list-style-type: none"> Flash simulator shall replicate caliber and range of various

UNCLASSIFIED DRAFT

JCA	Key System Attribute	Production Threshold	Production Objective
<p>Preparation 3. Force Application 3.2 Engagement</p>		<p>visible spectrum up to 3000m day; in IR spectrum up to 6000m day/night and generate another effect within 5-seconds. FASIT shall provide selectable and realistic audio effects for additional stimulation to include; human speech, animals, various threat/friendly vehicle/weapon sounds.</p> <ul style="list-style-type: none"> • Unit actions are constantly evolving during training events, therefore, system shall have the ability to rapidly change audio/visual/digital effects and replicate like-effects during the training event. • FASIT shall include Night Muzzle Flash Simulator effects. <p>Shall enable training facilities to accurately reflect doctrinal and COE conditions and threats by stimulating Army, Joint & Coalition Combat ID Sensors.</p>	<p>weapon systems.</p> <ul style="list-style-type: none"> • Olfactory stimulations may be realistic battlefield smells. • FASIT shall include capability to emit a threat ground-to-ground signal (laser, radar) to a ground system. Threat emitter shall be located downrange within the range fan and integrated with a threat target for ground-to-ground battlefield effects. Emitter shall be activated by the range operating system as a manual step. • Shall include capability to emit a friendly and/or threat signal (laser, radar) to a ground system. Integrate aerial and ground systems cooperative target identification. • Capability to emit a friendly signal (laser, radar) to an aerial system. Friendly emitter shall be located downrange within the range fan and integrated with a friendly target. Classified friendly emitters shall be standalone and not be integrated with the range operating system or range network.

UNCLASSIFIED DRAFT

JCA	Key System Attribute	Production Threshold	Production Objective
			<ul style="list-style-type: none"> • To further enhance situational awareness, ranges shall incorporate a Cooperative Target Identification (CTI), or like-solution, to live fire ranges & facilities that shall stimulate Soldiers and platforms of the presence of friendly forces in their battle space in accordance with Combat Identification (CID) DCR, 3 July 2007. • Shall have capability to produce various colors of smoke from multiple sources, to include Surface-to-Air missiles, and sustain for up to 5-minutes after initiation to replicate weapon effects. • FASIT shall include capability to emit a threat ground-to-air signal (laser, radar) to an Army air system. Threat emitter shall be located downrange within the range fan and integrated with a threat target for ground-to-ground battlefield effects. Emitter shall be activated by the range operating system as a manual step. • FASIT shall include carriers that can transport and execute

UNCLASSIFIED DRAFT

JCA	Key System Attribute	Production Threshold	Production Objective
			battlefield effects on different parts of the range based on the scenario.
		•	•
1. Force Support 1.2 Force Preparation	KSA #3 – Training Network	<ul style="list-style-type: none"> • System architecture shall provide improvements on the range environment that decrease the gap between operational environment and training experiences through its ability to manage data and information. • Establish and maintain communication connectivity 98% of the time, independent of location and media. • Shall provide ability for multimedia digital transfers between user selectable nodes of range; frequency bands commensurate with emission bandwidth; power required to meet system data transfer and range requirements. • Network devices, cabling, and connectors shall be compatible with established standards to reduce logistics burden of maintaining system. • Combination of wire and wireless media, including simultaneous operations, where commands using one method of communication are passed to the other in order to complete scenario. • Network management to include full spectrum of measures needed to execute range training, from planning to training feedback. 	<ul style="list-style-type: none"> • Network shall establish and maintain communication connectivity 99% of the time, independent of location and media. • FASIT shall have ability to operate in tactical electronic countermeasures environment. • Fault management of system shall detect and notify; identify and diagnose problems in performance and configuration; recommend solutions, and manage/track faults until corrected. • Data logging capability shall support troubleshooting and performance feedback.

UNCLASSIFIED DRAFT

JCA	Key System Attribute	Production Threshold	Production Objective
		<ul style="list-style-type: none"> • Utilize less than 10% of the available bandwidth • Minimize effects of emissions and co-site interference between two or more adjacent nodes. Transfer device configuration data to any node within network. Monitor status of network devices and network condition, report changes in status, and respond to individual device and overall network changes. Security services and mechanisms for authentication, integrity, auditing, and access control IAW DIACAP. Ability to add one or more nodes to existing range network. • Training Network shall be compatible with local wiring standard (for legacy and current wired infrastructure) or local frequency availability (for wireless target systems). 	

817

818 6 (U) Other System Attributes

819

820 6.1 (U) Embedded Instrumentation, Electronic Attack (EA) and Wartime Reserve Mode (WARM)

821 requirements The FASIT Sustainment KPP includes requirements to both, track performance history and
 822 predict future device/hardware failures.

823

824 6.2 (U) Human System Integration

825 6.2.1 (U) **Manpower.** Introduction of the FASIT capability shall not increase the overall number of
 826 personnel, both, military and civilian, required to operate, maintain, and support the item.

827 6.2.2 (U) **Personnel.** The operation, maintenance, and support of the FASIT capability shall not require
 828 aptitudes, skills, or capabilities beyond those currently present in the user population.

829 6.2.3 (U) **Training.** The instruction and resources required to provide the Warfighter and maintainer, with
 830 knowledge, skills and abilities, in proper operation, maintenance and support of Army systems shall not
 831 significantly increase due to the introduction of the FASIT capability.

832 6.2.4 (U) **Human Factors Engineering.** The FASIT capability design shall promote effective Soldier-
 833 machine integration for optimal total system performance using MIL STD-46855A, Human Engineering

UNCLASSIFIED DRAFT

834 Requirements for Military Systems, Equipment, and Facilities as well as MIL-STD-1472G, Design Criteria
835 Standard Human Engineering to provide guidance on Human Factors Engineering. Design principles taking
836 into account human capabilities and limitations shall be incorporated into system definition, design,
837 development and evaluation. The FASIT capability shall not interfere with the performance of common
838 Soldier tasks. Equipment design must consider mission-dependent tasks and demand through consultation
839 with SMEs, in order to maximize ease of use, minimize workload and enhance mission performance.

840 **6.2.5 (U) System Safety.** The FASIT capability design and operational characteristics shall minimize the
841 possibilities for accidents or mishaps caused by human error or system failure. Safety, health,
842 environmental, fire and ergonomic hazards associated with the use and maintenance of the FASIT capability
843 shall be identified, evaluated/assessed, and mitigated or controlled to an acceptable level. This application of
844 higher safety standards applies to all personnel coming into contact with the range, either as a user of the
845 total range system or a maintainer of the equipment. A Safety Assessment Report (SAR) will be completed
846 to identify any known hazards which can cause death, injury, or illness and will be submitted to the US
847 Army Combat Readiness/Safety Center (CRC) Safety. The resolution of all hazards will be formally
848 documented through a hazard tracking system and the risk associated with the residual hazard, if any, will
849 be accepted by the designated approving authority IAW AR 385-10 The Army Safety Program and DA Pam
850 385-16 System Safety Management Guide.

851
852 **6.2.6 (U) Health Hazards.** The FASIT capability shall not present any uncontrolled health hazards to the
853 operator or maintainer through its service lifetime. A Health Hazard Assessment (HHA) shall be requested
854 from the U.S. Army Public Health Command (USAPHC) early in the development or procurement process.
855 This HHA shall be updated at each Milestone Decision Review (MDR) as required by AR 40-10.

856
857 6.3 (U) Natural Environmental Factors
858 **6.3.1 (U) Natural Environmental Factors.** Components and equipment shall be capable of fully operating in
859 CONUS and OCONUS locations.

860 **6.3.2 (U) Define Mission Capability in the various environments.** Materials going into components shall be
861 able to withstand the environmental conditions and stresses of the environment into which they are expected
862 to be utilized.

863 **6.3.3 (U) Expected Mission Capability.** The FASIT capability shall be mission capable in all environments.
864 The system must meet basic cold and hot weather conditions and remain operational in adverse weather
865 conditions with no degradation of basic capabilities.

866
867 6.4 (U) Physical and Operational Security FASIT must prevent inadvertent release of data and information.
868 Network shall be capable of ensuring only authorized users are permitted access to the system and
869 supporting networks.

870
871 6.5 (U) Weather, Oceanographic, and Astrophysical Support No new weather, oceanographic and
872 astrophysical support requirements are envisioned for FASIT.

873
874 6.6 (U) Allied Coalition Support FASIT shall not require support for allied and coalition operations.

875
876 6.7 (U) Transportability and Deployability Considerations The FASIT shall be transportable using standard
877 material handling equipment using military and commercial trucks, rail, ship and aircraft. Road movement
878 includes both, hard surface and improved roads.

879

UNCLASSIFIED DRAFT

880 6.8 (U) Space, Weight and Power – Cooling (SWaP-C) margin requirements/open systems attributes. The
881 first proponent KPP – Logistics Support fully addresses maximizing commonality and interoperability
882 among all FASIT components.

883

884 7 (U) Spectrum Requirements

885

886 7.1 (U) Electromagnetic Environmental Effects (E3) Summary

887 7.1.1 (U) FASIT targetry control/communication always operated in as a non-tactical application.

888 7.1.2 (U) Due to the nature of the military operations, operational environments and equipment often comes
889 into increased level of electromagnetic radiation hazards. FASIT is not a mission-critical combat system and
890 has no safety issues regarding hazards of electromagnetic radiation to ordnance, fuels, and personnel, and
891 shall be controlled to low risk.

892 7.1.3 (U) FASIT shall be mutually compatible with other spectrum dependent equipment within its intended
893 range environment. FASIT shall not cause malfunction or degrade performance of other electronic systems
894 that must interface. FASIT shall not be degraded by other electronic equipment that may be installed in
895 close proximity.

896

897 7.2 (U) Spectrum Summary

Table 7.2 – Data Throughput Table			
File Type		Size	Transmission Frequency
Voice	Yes	Large	High
Data File	Yes	Large	High
Streaming Video	Yes	Large	High

898

899

900

901

Small = 1-Byte-100 KB
Medium = 101-999KB
Large = 1 MB or larger

Low = 1 – 50
Medium = 51-100
High = 101 or greater

902 8 (U) Intelligence Supportability. Intelligence Supportability is not applicable to the FASIT.FASIT does not
903 produce, consume, process, or handle intelligence information, with exception to geospatial information
904 detailed below.

905

906 8.1 (U) Intelligence Support. Geospatial Information and Intelligence Support. FASIT shall use geospatial
907 and imagery data to include National Geospatial-Intelligence Agency (NGA) standard military data formats,
908 Digital Topographic Support System (DTSS)/civilian file formats (Esri file formats, GeoPDFs, GEOTIFs,
909 United States Geological Survey (USGS) DOQQ and DRGs, etc.), Army Geospatial Center (AGC)
910 Common Map Background (CMB) formats, and compression formats (Mr SID, JPEG2000, etc.). FASIT
911 shall support NGA Digital Terrain Elevation Data (DTED) levels 1 – 2 and High Resolution Terrain
912 Elevation (HRTE) data sets, foundation, and mission specific data sets. FASIT shall employ the LTT core
913 components and Command, Control, Communications, Computers, Intelligence, Surveillance and
914 Reconnaissance (C4ISR) interface to the DTSS. Digital mapping information delivered by FASIT must
915 provide fidelity equal to or greater than that of the paper based maps used by the exercise Units and be
916 compatible with digital maps organic to Unit tactical Army Battle Command System (ABCS). Digital
917 terrain information shall be requested from NGA, AGC, and the Army Installation Geospatial Information
918 and Services (IGI&S) program and provided to developmental and LCCS contractors as Government-
919 Furnished Information (GFI). Details include, but are not limited to: Universal Transverse Mercator (UTM)
920 grid lines, contour lines, man-made features, vegetation, water, elevation, roads, and trails. The required
921 digital map scales are 1:250,000, 1:100,000, 1:50,000, 1:25,000, and 1:5,000. Digital over flight maps are

UNCLASSIFIED DRAFT

922 1:50,000 and 1:25,000 scales.

923

924 8.2 (U) Compliance with Intelligence Policy. FASIT has no issues related to Intelligence Policy

925

926 9 (U) Weapon Safety Assurances. Any pyrotechnic weapons effects or battlefield effects munition shall be
927 type classified and safety certified and resourced through the Standards in Training Commission (STRAC).
928 Any pyrotechnic launchers shall be in receipt of a material release and safety certification.

929

930 10 (U) Manufacturing Readiness

931

932 10.1 (U) Manufacturing Readiness Assessment. The preponderance of a FASIT system is comprised of
933 software that is developed and managed under the Live Training Transformation Consolidated Product-Line
934 Management initiative. The software is GOTS, posted on a Government managed web portal and is
935 available to the industry base for reuse on all FASIT programs. The Technology Readiness Level (TRL) for
936 this is 9 as the system has been proven in successful mission operations. The hardware solution for the
937 FASIT program is detailed in the table below, most applications are at a TRL 9 but a few capabilities are
938 still being developed and have a lower TRL.

Associated KPP/KSA	Critical Tech Element	Critical Element Description
KPP: Force Protection	Not Applicable (N/A)	
KPP: Survivability	N/A	
KPP: Net-Ready	N/A	
KPP: Sustainment	No critical technology	
KPP: Training	No critical technology	
KPP: Energy	N/A	
KPP: Logistical Support	No critical technology	
KPP: Target System	Hit Sensing	Capability to sense munitions being fired at stationary and moving targets and providing instantaneous feedback and scoring to the shooters and the coaches.
KPP: Target System	Thermal/non-thermal multi-dimensional representation	The targets need to be able to accurately stimulate target sensing systems (FLIR, night vision, etc) on vehicles and dismounts.
KPP: Target System	Scenario driven trackless vehicles	Targets should be programmable to operate independently based on engagement feedback, through computer scripting, or by manual control as they maneuver through the target range. System needs to operate on a moving apparatus that allows for maneuvering in all directions.
KPP: Target System	Maritime Targets	Targets need to be able to operate in water while providing protection to the mover from the live fire and protection from a highly corrosive salt environment.
KPP: Control System	Computing Capability to support the control of target ranges and the feedback to the users.	Software needs to be Government developed and controlled so that it can be used across multiple types of ranges while driving down new development and ongoing sustainment costs. Software must be able to configure the

UNCLASSIFIED DRAFT

Associated KPP/KSA	Critical Tech Element	Critical Element Description
		range for specific scenarios, collect engagement data, and provide after action review feedback to the users.
KSA: Battlefield/Weapon Effect System	Ground to air signal emitter	The system must be able to emit signals from ground devices to stimulate the devices on aircraft systems to replicate that an engagement is taking place on the platform.
KSA: System Power	No critical technology	
KSA: Training Network	No critical technology	

Table 10.1 Critical Technology Element

Critical Tech Element	TRL	Rationale
Hit Sensing	9	Location of Miss and Hit systems have been fielded by multiple vendors to the target ranges and have successfully demonstrated operational mission success. The systems are able to accurately track ballistic impact location and provide that feedback to the user.
Thermal/non-thermal multi-dimensional representation	3	Currently the Army uses heating blankets to replicate the thermal signature of target systems. These blankets do not provide a realistic representation of the real target and are easily damaged/destroyed by the engagement. There is an ongoing Small Business Innovative Research initiative to develop an infrared thermal generator to provide an accurate representation of the target system while providing protection to the system form the engagement lowering the lifecycle costs.
Scenario driven trackless vehicles	6	Autonomous target systems have been demonstrated for both moving infantry and armor target types in the field. The next step is to actually engage these targets with live fire and demonstrate their usability and survivability in an operational environment.
Maritime targets	6	PMITTS has developed a prototype applied to this use case.
Computing Capability to support the control of target ranges and the feedback to the users.	9	The software for the control systems have been fielded by multiple vendors to the automated ranges and have successfully demonstrated operational mission success. The automated ranges are able to control the ranges, collect feedback, and provide after action review capability.
Ground to air signal emitter	2	Little research has been applied to this use case.

Table 10.2 Technology Readiness Level

10.2 (U) Critical Manufacturing Challenges. Since FASIT is already fielded as NGATS, therefore, there are no manufacturing challenges to meet Threshold requirements.

11 (U) DOTmLPF-P Considerations

11.1 (U) Doctrine FASIT shall have no impact on Doctrine.

11.2 (U) Organization The operation of FASIT does not require a new organization, or modification to

UNCLASSIFIED DRAFT

951 current organizations.

952 11.3 (U) Training

953 11.3.1 System Training Plan Summary. A System Training Plan waiver was approved 25 May 2011, DA,
954 U.S. Army Combined Arms Center and Fort Leavenworth, ATTN: ATIC-TCT, Fort Leavenworth, KS
955 66027-2300.

956 11.3.2 The PM shall provide all initial and sustainment training resources to train all identified
957 operator/maintainer and maintain proficiency throughout the lifecycle. The training shall consist of
958 operation and maintenance of the FASIT for newly assigned operators and sustainment training. Training
959 shall be conducted to support incremental fielding of all components and capabilities.

960 11.4 (U) Materiel

961 11.4.1 FASIT shall continue to use commercial or military standard components, parts, and assemblies of
962 reliable construction. Commercial products, processes, and practices shall be used to reduce development,
963 production, and operational support costs. FASIT components shall be survivable with ballistic shock
964 associated with gunfire and direct and indirect fire impacting in the proximity of the components.

965 11.4.2 Technical Data Package. The technical data package, to include product drawings in accordance with
966 Military Standard 31000, shall be procured by the government for each FASIT variant to accommodate cost
967 effective material change, configuration control, procurement, and parts commonality requirements.

968 11.5 (U) Leadership FASIT has no impact on leadership and education. On a range, FASIT provides a set of
969 conditions (targetry) for leaders to conduct actions to standard.

970 11.6 (U) Personnel FASIT does not increase the number of personnel required to operate the system, nor
971 does the FASIT require new qualifications for existing personnel.

972 11.7 (U) Facilities FASIT does not require new facilities.

973 11.8 (U) Policy Issues FASIT does not require changes to existing policy or public law.

974

975 12 (U) Program Affordability

976

977 12.1 (U) Life Cycle Cost Analysis Citation The primary purpose of this Cost-Benefit Analysis (C-BA) is to
978 address Logistics Support shortfalls related to FASIT in order to ensure adequate range availability to
979 support live-fire training requirements for Soldiers. This analysis presents costs and benefits of the potential
980 solutions in addressing logistic/sustainment costs and methodology. The C-BA also includes incorporating
981 improved AAR capabilities on existing maneuver ranges. The following four course of action were selected
982 for analysis. Upon completion of scoring, COA 4 was selected.

983 COA 1 – Status Quo

984 COA 2 – Status Quo plus AAR capabilities for legacy maneuver ranges

985 COA 3 - Recapitalization of targetry

986 COA 4 – Recapitalization of targetry plus AAR capabilities for legacy maneuver ranges

987

988 12.2 (U) Summary of Resources Required (Not Included/FOUO)

989

990 **Table 12.2 Summary of Resources Required**

991

992

993

UNCLASSIFIED DRAFT

994 (U) Appendix A: References
995

Title	Date	Notes
Army Capability-based Architecture Development and Integration Environment (ArCADIE)	NA	
ADP 7-0 Training Units and Developing Leaders	23 Aug 12	
AR 70-1 Army Acquisition Policy	22 Jul 11	
AR 71-9 Warfighting Capabilities Determination	28 Dec 09	
AR 350-52 Army Training Support System	17 Jan 14	
AR 385-63 Range Safety	30 Jan 12	
AR 525-29 Army Force Generation	14 Mar 11	
AR700-18 Provisioning of U.S. Army Equipment	20 Sep 09	
AR 700-127 Integrated Logistics Support	7 Oct 14	
AR 750-1 Army Material Maintenance Policy	12 Sep 13	
CJCSI 3170.01I	23 Jan 15	
DA PAM 350-38 Standards in Training	Sep 15	
JCIDS Manual	12 Feb 15	
TC 25-8 Training Ranges	20 May 10	
Technology Readiness Assessment Guidance	April 2011	
TRADOC CPD Writer's Guide	31 Mar 15	
TRADOC Regulation 71-20	28 Jun 13	

996

UNCLASSIFIED DRAFT

997

(U) Appendix B: Acronyms

Acronym	Definition
AAR	After Action Review
ABCS	Army Battle Command System
AC	Alternate Current
AGC	Army Geospatial Center
Am	Material Availability
Ao	Operational Availability
APA	Additional Performance Attribute
ASA(ALT)	Assistant Secretary of the Army (Acquisition, Logistics and Technology)
BCT	Brigade Combat Team
BOS	Battlefield Operating Systems
CALFEX	Combined Arms Live Fire Exercises
CID	Combat Identification
COE	Centers of Excellence
CONUS	Continental United States
COTS	Commercial Off the Shelf
CTC	Combat Training Center
CTC-IS	Combat Training Center – Instrumentation System
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CTI	Cooperative Target Identification
DC	Direct Current
DIA	Defense Intelligence Agency
DMPRC	Digital Multipurpose Range Complex
DRTS	Digital Range Training System
EA	Electronic Attack
EUL	Economic Useful Life
FASIT	Future Army System of Integrated Targets
FOC	Full Operational Capability
FOF	Force on Force
FOT	Force on Target
GFE	Government Furnished Equipment
GOTS	Government Off the Shelf
HTT	Human-type Targets
ICD	Interface Control Document
IFF	Identification Friend/Foe
IGI&S	Installation Geospatial Information and Services
I-MTS	Integrated-MOUT Training System
IOC	Initial Operational Capability

UNCLASSIFIED DRAFT

Acronym	Definition
JRTC	Joint Readiness Training Center
KPP	Key Performance Parameter
KSA	Key System Attribute
LCCS	Life Cycle Contractor Support
LCMC	Life Cycle Management Command
LFX	Live Fire Exercises
LT2-FTS	Live Training Transformation-Family of Training Systems
LVC-IA	Live, Virtual and Constructive - Information Architecture
MILES	Multiple Integrated Laser Engagement System
MMW	Millimeter Wave
MTBF	Mean Time Between Failure
MTTR	Mean Time to Repair
NET	New Equipment Training
NGA	National Geospatial-Intelligence Agency
NGATS	New Generation Army Targetry System
NR-KPP	Net Ready Key Performance Parameter
NTE	Not to Exceed
O&S	Operation and Support
O/C	Observer/Controller
OCONUS	Outside Continental United States
OPFOR	Opposing Force
OR	Operational Readiness
ORD	Operational Requirement Document
PD	Presentation Device
POI	Program of Instruction
RAM	Reliability, Availability, Maintainability
RETS	Remote Target System
SCORM	Sharable Content Object Reference Model
SIM	Simulation
STIM	Stimulation
STRAC	Standards in Training Commission
TACOM	Tank and Automotive Command
TADSS	Training Aids, Devices, Simulators and Simulations
TC	Target Control
TDR	Training Device Requirement
TES	Tactical Engagement System
TESS	Tactical Engagement Simulation System
TSDS	Targetry and Simulator Device System

UNCLASSIFIED DRAFT

Acronym	Definition
TSP	Training Support Plan
UAS	Unmanned Aerial System
UGS	Unmanned Ground System
WARM	Wartime Reserve Mode

998
999

DRAFT

UNCLASSIFIED DRAFT

1000

(U) Appendix C: Glossary

Term	Definition
Acquisition Category	A method of grouping programs for control purposes: ACAT I programs are Major Defense Acquisition Programs (MDAPs). ACAT IA programs are Major Automated Information Systems (MAISs) or programs designated by the Assistant Secretary of Defense for Networks and Information Integration (ASD(NI2)) to be ACAT IA. ACAT II programs are defined as those acquisition programs that do not meet the criteria for an ACAT I program, but do meet the criteria for a major system. ACAT III programs are defined as those acquisition programs that do not meet the criteria for an ACAT I, an ACAT IA, or an ACAT II.
Acquisition Program Baseline	A document that contains the most important cost, schedule, and performance parameters (both objectives and thresholds) for the program.
After Action Review	A method of providing feedback to organizations by involving participants in the training diagnostic process in order to increase and reinforce learning. See After Action Report.
All Army Activities	
All Views	Describes the overarching aspects of architecture context that relate to all viewpoints.
Appropriation	An authorization by an act of Congress that permits Federal agencies to incur obligations and make payments from the Treasury. An appropriation usually follows enactment of authorizing legislation. An appropriation act is the most common means of providing budget authority (see Budget Authority (BA)).
Army Capabilities Integration Center	ARCIC develops concepts and capabilities, evaluates proposed Army modernization solutions, and integrates these capabilities across DOTMLPF. We also communicate with government, industry and Army stakeholders to ensure awareness and understanding of Army modernization priorities. These four lines of effort align to support an agile and adaptive Army that meets current, future, and unexpected requirements of the Joint Force.
Army Master Range Plan	The master repository for the DCS, G-3/5/7 validated, prioritized, and funded range modernization and training land acquisition projects. It serves as the Army's database of record for all Army-approved range projects in all resourcing categories.
Battle Effects Simulator	The BES simulates the effects of a target being killed by shooting out smoke or some form of an explosion. The BES is controlled by the range control station to fire a selected cartridge or cartridges when a hit is scored.
Built-In Test	The hardware and software facilities integrated into equipment to monitor equipment functionality and report the result.
Built-In Test Equipment	The hardware or software facilities integrated into a system, equipment, replaceable item or module to monitor functions and

UNCLASSIFIED DRAFT

Term	Definition
	check out serviceability.
Capability Development Document (CDD)	A document that captures the information necessary to develop a proposed program(s), normally using an evolutionary acquisition strategy. The CDD outlines an affordable increment of military useful, logistically supportable, and technically mature capability. (CJCSI 3170.01C)
Capability Production Document (CPD)	A document that addresses the production elements specific to a single increment of an acquisition program. (CJCSI 3170.01C)
Catalog of Approved Requirement Documents (CARDS)	CARDS is an HQDA, G-37 Future Warfighting Capabilities Division (DAMO-CIC) publication that lists approved materiel capabilities documents (MCDs). Its purpose is to provide up-to-date reference information to the capabilities and materiel development communities.
Combat Identification	System to identify Friend/Foe/Neutral Infantry and Vehicle Targets (Thermal, Visual, Low-light). Friendly targets use Infantry Soldier Marking Systems (Glint Tape, IR Flag, Helmet Markings), Vehicle Joint Combat ID Marking Systems (TIPs, CIPs) and Phoenix Lights.
Combat Training Center (CTC)	The Army's CTC Program comprises the Mission Command Training Program (MCTP), Joint Multinational Readiness Center (JMRC), Joint Readiness Training Center (JRTC), and the National Training Center (NTC). A CTC rotation is all training events conducted through the Army's CTC program in accordance with Army Regulation (AR) 350-50, Combat Training Center Program.
Combat Training Center-Instrumentation System (CTC-IS)	The CTC-IS is an information technology based communications, analysis and feedback system at the Maneuver Combat training Centers (MCTCs) that provides a realistic operational environment for training the brigade combat team and below in preparation for deployment to conduct Decisive Actions. It is comprised of voice, video and data instrumentation subsystem networks ... CTC-IS is scalable to collect, report, store, manage, process and display event data for 10,000 instrumented players and 100,000 constructive entities. The Instrumentation System (IS) provides the Combat Trainers (CT) critical situational awareness for training safety, analysis, and feedback capabilities to conduct After Action Review (AARs). CTC-IS is a key part of the Live Training Transformation – Family of Training Systems (LT2-FTS) and is based on the Common Training Instrumentation Architecture (CTIA). It leverages advanced technology in a modular and component-based manner and provides the foundation for common components across the live training product line. Common components such as exercise planning, exercise preparation, exercise control, after-action review preparation and presentation, in concert with CTIA services, processes, rules and standards, support the full spectrum of training. CTC-IS is interoperable with other external systems through DIS, HLA or

UNCLASSIFIED DRAFT

Term	Definition
	TENA protocols. The CTC-IS program also provides the National Training Center (NTC) and the Joint Multinational Training Center (JMRC) a mobile instrumentation system that provides a mobile training capability to support ARFORGEN and Unified Land Operations.
Command, Control, Communications, Computers, Intelligence, Surveillance And Reconnaissance (C4ISR)	The elements include but are not limited to: sensor data processing displays, communications, software, the concomitant systems engineering required to tie these technologies together, and the personnel to make these systems function. The functions also include information systems and information warfare.
Commercial Off-The-Shelf (COTS)	Commercial items that require no unique Government modifications or maintenance over the life cycle of the product to meet the needs of the procuring agency.
Common Training Instrumentation Architecture (CTIA)	The CTIA is the architecture core of the Live Training Transformation Strategy. CTIA is the technical architecture that provides commonality across training instrumentation systems and interoperability across live, virtual, and constructive training systems. It consists of standards and protocols to be used by system developers, and is the core software component of training instrumentation systems.
Concept of Operations	A verbal or graphic statement, in broad outline, of a commander's assumptions or intent in regard to an operation or series of operations. The CONOPS frequently is embodied in campaign plans and operation plans; in the latter case, particularly when the plans cover a series of connected operations to be carried out simultaneously or in succession. The concept is designed to give an overall picture of the operation. It is included primarily for additional clarity of purpose. Also called commander's concept.
Cooperative Target Identification (CTI)	Identification, Friend Or Foe (IFF) type transponder on personnel and platforms
Cost-Benefit Analysis (CBA)	Provides decision makers with facts, data, and analysis required to make informed decisions. A decision support tool that documents the predicted effect of actions under consideration to solve a problem or take advantage of an opportunity. A structured proposal that functions as a decision package for organizational decision makers. Defines a solution aimed at achieving specific Army and organizational objectives by quantifying the potential financial impacts and other business benefits such as savings and/or cost avoidance; revenue enhancements and/or cash-flow improvements; performance improvements; and the reduction or elimination of a capability gap.
Course Of Action (COA)	1. Any sequence of activities that an individual or a unit may follow. 2. A possible plan open to an individual or a commander that would accomplish or is related to the accomplishment of a mission. 3. The

UNCLASSIFIED DRAFT

Term	Definition
	scheme adopted to accomplish a job or mission. 4. A line of conduct in an engagement. 5. A product of the Joint Operation Planning and Execution System concept development phase. See FM 101-5.
Department of Defense Architectural Framework (DoDAF)	The Department of Defense Architecture Framework (DoDAF) is the overarching, comprehensive framework and conceptual model enabling the development of architectures to facilitate the ability of DoD managers at all levels to make key decisions more effectively through organized information sharing across the Department, Joint Capability Areas (JCAs), Mission, Component, and Program boundaries. The DoDAF serves as one of the principal pillars supporting the DoD Chief Information Officer (CIO) in his responsibilities for development and maintenance of architectures required under the Clinger-Cohen Act. DoDAF is prescribed for the use and development of Architectural Descriptions in the Department. It also provides extensive guidance on the development of architectures supporting the adoption and execution of Net-centric services within the Department.
Digital Range Training System (DRTS)	DRTS replaces obsolete, inadequate training methods and equipment in order to stimulate new weapons systems, incorporate the Digitized Force, and provide enhanced training data collection and After Action Review capabilities consisting of Digital Multi-purpose Range Complex (DMPRC), Digital Multi-purpose Training Range (DMPTR), Battle Area Complex (BAX), and Digital Air-Ground Integration Range (DAGIR) programs.
DoD IT Standards Registry	The DoD IT Standards Registry (DISR), is an online repository of IT standards formerly captured in the Joint Technical Architecture (JTA), Version 6.0. DISR replaces JTA.
Embedded Tactical Systems	On board warfighter tactical systems (personnel or vehicles/aircraft)
Exportable Training Capabilities	A combination of exportable, tailored, CTC program training enablers provided as an additional level of support to enhance the training fidelity of a commander's home station training plan that otherwise could not be achieved.
Full Operational Capability (FOC)	The full attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics, which is manned and operated by a trained, equipped, and supported military unit or force. A program's capability development document (CDD) and capability development document (CPD) defines what actually constitutes FOC and when it should be attained.
Global Positioning System	A satellite constellation that provides highly accurate position, velocity, and time navigation information to users. See also way point. See FM 3-25.26.
High Level Architecture	A general-purpose architecture for simulation reuse and interoperability, which allows for computer simulations to

UNCLASSIFIED DRAFT

Term	Definition
	communicate with other simulations – regardless of platform type. Communication between these simulations is made possible and managed by a Runtime Infrastructure (RTI), and the use of a FOM. The Object Model Template (OMT) provides the common framework for the communication between the various HLA simulations. HLA was produced as a result of a merger of the DIS protocol and the Aggregate Level Simulation Protocol (ALSP).
Home Station Instrumentation Training System (HITS)	HITS provides a live environment real-time training enabler that can be used in a stand-alone mode or in conjunction with Virtual & Constructive enablers to enhance homestation training at BN and below.
Information Assurance	A measure of confidence that the security features and architecture of an IT/network system result in trusted information.
Information Support Plan	A set of information supporting interoperability test and certification. Entered through the GTG-F portal, the ISP contains or links to the NR KPP along with supporting architectural data.
information system	Computer-based information systems are complementary networks of hardware and software that people and organizations use to collect, filter, process, create, and distribute data.
Information System	The computer (or IT)-based portion of a business system.
Information Technology	Any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency.
Initial Capabilities Document (ICD)	Documents the need for a materiel approach to a specific capability gap derived from an initial analysis of materiel approaches executed by the operational user and, as required, an independent analysis of materiel alternatives. It defines the capability gap in terms of the functional area, the relevant range of military operations, desired effects and time. The ICD summarizes the results of the DOTMLPF analysis and describes why nonmateriel changes alone have been judged inadequate in fully providing the capability. (CJCSI 3170.01C)
Initial Operational Capability (IOC)	The IOC is the first attainment of the capability by a modified table of organization and equipment (MTOE) unit and supporting elements to operate and maintain effectively a production item or system provided the following: The item or system has been type classified as standard or approved for limited production; the unit and support personnel have been trained to operate and maintain the item or system in an operational environment; The unit can be supported in an operational environment in such areas as special tools, test equipment, repair parts, documentation, and training devices; Initial Operational Test (IOT); The dedicated field test, under realistic

UNCLASSIFIED DRAFT

Term	Definition
	combat conditions, of production or production representative items of weapons, equipment, or munitions to determine operational effectiveness, suitability, and survivability for use by representative military or civilian users. IOT is usually the “go/no go” test prior to the full rate production (FRP) decision review.
Interface Control Document (ICD)	Interface control drawing or other documentation that depicts physical, functional, performance, and test interfaces of related or co-functioning products.
Joint Capabilities Integrated Development System (JCIDS)	Policy and procedures that support the Chairman of the Joint Chiefs of Staff and the Joint Requirements Oversight Council in identifying, assessing, and prioritizing joint military capability needs. (CJCSI 3170.01C)
Joint Capability Area (JCA)	JCAs are collections of similar capabilities logically grouped to support strategic investment decisionmaking, capability portfolio management, capability delegation, capability analysis (gap, excess, and major trades), and capabilities-based and operational planning. JCAs provide a common capabilities language for use across many related DoD activities and processes and are an integral part of the capabilities-based planning process. See CJCSI 3170.01.
Joint Readiness Training Center (JRTC)	JRTC at Fort Polk, LA train Army BCTs by conducting force-on-force and live-fire training in a Joint scenario across the range of conflict using an LVC training model as portrayed by a professional OPFOR and controlled by an expert and experienced OPS GRP. Training occurs under tough, realistic, combat-like conditions across a wide range of likely tactical operations and MREs capable of full integration into higher-level exercises and scenarios. Within the ARFORGEN readiness model, JRTC will normally focus on collective training events supporting BCTs transitioning between the train/ready and available force pools. However, JRTC may also be tasked to execute METL-focused rotations in support of BCTs progression through the train/ready force pool when required by ARFORGEN demands.
Joint Requirements Oversight Council (JROC)	An advisory council to the Chairman, Joint Chiefs of Staff (CJCS) that directly and indirectly supports the CJCS role as the principal military advisor to the President, the National Security Council, the Homeland Security Council, and the Secretary of Defense. See CJCSI 5123.01.
Joint Multinational Readiness Center (JMRC)	The Joint Multinational Readiness Center, headquartered in Hohenfels, Germany is the Europe-based Combat Training Center (CTC) with a world-wide mobile training capability, trains leaders, staffs, and units up to Brigade Combat Teams and multinational partners.
Key Interface Profile (KIP)	The definitions of the protocols and logical processes by which various existing systems and DOD networks, e.g., DRSN, SIPRNET,

UNCLASSIFIED DRAFT

Term	Definition
	NIPRNET, DVS-G, and anticipated future networks and systems will access the Global Information Grid suite of services.
Key Performance Parameter (KPP)	Those minimum attributes or characteristics considered most essential for an effective military capability. KPPs are validated by the JROC for JROC interest documents, by the Functional Capabilities Board for Joint Impact documents, and by the DoD Component for Joint Integration or Independent documents. CDD and CPD KPPs are included verbatim in the Acquisition Program Baseline. (CJCSI 3170.01C)
Key System Attribute	An attribute or characteristic considered crucial in support of achieving a balanced solution/approach to a key performance parameter (KPP) or some other key performance attribute deemed necessary by the sponsor. KSAs provide decision makers with an additional level of capability performance characteristics below the KPP level and require a sponsor 4-Star, defense agency commander, or principal staff assistant (PSA) to change.
Line Of Sight	The unobstructed path from a soldier, weapon, weapon sight, electronic-sending and -receiving antennas, or piece of reconnaissance equipment to another point. See also intervisibility. (FM 34-130)
Materiel Availability	The measure of the percentage of the total inventory of a system operationally capable, based on materiel condition, of performing an assigned mission.
Materiel Reliability	Probability system will perform without failure over specified time.
Mean Cycles Between Failures	Average number of cycles between failure
Mean Time Between Failure (MTBF)	Mean time between failures (MTBF) is the predicted elapsed time between inherent failures of a system during operation. MTBF can be calculated as the arithmetic mean (average) time between failures of a system. The MTBF is typically part of a model that assumes the failed system is immediately repaired, as a part of a renewal process.
Mean Time to Recovery	Mean time to recovery (MTTR) is the average time that a device will take to recover from any failure. Examples of such devices range from self-resetting fuses (where the MTTR would be very short, probably seconds), up to whole systems which have to be repaired or replaced.
Mean Time To Repair (MTTR)	Mean Time To Repair (MTTR) is a basic measure of the maintainability of repairable items. It represents the average time required to repair a failed component or device.[1] Expressed mathematically, it is the total corrective maintenance time divided by the total number of corrective maintenance actions during a given period of time.[2] It generally does not include lead time for parts not readily available or other Administrative or Logistic Downtime (ALDT).
Military Operations in Urban	A terrain complex where manmade construction impacts on the

UNCLASSIFIED DRAFT

Term	Definition
Terrain (obsolete - see UO)	tactical options available to commanders. Military operations in urban terrain facilities replicate urban environments.
Millimeter Wave (MMW) Presentation	Electromagnetic imaging of targets through millimeter wave sensors
Mobile Remote-Control	Need definition for FASIT - is it equiv to NTC 350-1 "Remote Control Unit"?
Multiple Integrated Laser Engagement System (MILES)	Provides real-time casualty effects during Force on Force training scenarios, permitting realistic combat training without the hazards of live ammunition. MILES provides the capability for force-on-force, real-time tactical engagement at unit sizes up to battalion level.
National Training Center	NTC at Fort Irwin, CA train Army BCTs by conducting force-on-force and live-fire training in a Joint scenario across the range of conflict using an LVC training model as portrayed by a professional OPFOR and controlled by an expert and experienced OPS GRP. Training occurs under tough, realistic, combat-like conditions across a wide range of likely tactical operations and MREs capable of full integration into higher-level exercises and scenarios. Within the ARFORGEN readiness model, NTC will normally focus on collective training events supporting BCTs transitioning between the train/ready and available force pools. However, NTC may also be tasked to execute METL-focused rotations in support of BCTs progression through the train/ready force pool when required by ARFORGEN demands.
Net-Ready	DOD IT that meets required information needs, information timeliness requirements, has IA accreditation, and meets the attributes required to support military operations, to be entered and managed on the network, and to effectively exchange information for both the technical exchange of information and the operational effectiveness of that exchange. DOD IT that is net-ready enables warfighters and DOD business operators to exercise control over enterprise information and services through a loosely coupled, distributed infrastructure that leverages service modularity, multimedia connectivity, metadata, and collaboration to provide an environment that promotes unifying actions among all participants. Netreadiness requires that IT operate in an environment where there exists a distributed information processing environment in which applications are integrated; applications and data independent of hardware are integrated; information transfer capabilities exist to ensure communications within and across diverse media; information is in a common format with a common meaning; there exist common human-computer interfaces for users; and there exists effective means to protect the information. Net-Readiness is critical to achieving the envisioned objective of a cost-effective integrated environment. Achieving and maintaining this vision requires interoperability: a. Within a Joint Task Force/combatant command

UNCLASSIFIED DRAFT

Term	Definition
	area of responsibility (AOR). b. Across combatant command AOR boundaries. c. Between strategic and tactical systems. d. Within and across Services and agencies. e. From the battlefield to the sustaining base. f. Among U.S., Allied, and Coalition forces. g. Across current and future systems.
Non-Classified Internet Protocol Router Network	The Nonsecure Internet Protocol (IP) Router Network (abbreviated as "NIPRNet," but commonly written "NIPRNET"), but prevalently referred to as the "'Non-classified' IP Router Network," is used to exchange Sensitive But Unclassified (SBU) information between "internal" users as well as providing users access to the Internet. NIPRNet is composed of Internet Protocol routers owned by the United States Department of Defense (DOD).
Objective	1. The clearly defined, decisive, and attainable goals towards which every military operation should be directed. 2. The specific target of the action taken (for example, a definite terrain feature, the seizure or holding of which is essential to the commander's plan, or, an enemy force or capability without regard to terrain features). (NATO) The physical object of the action taken, e.g., a definite tactical feature, the seizure and/or holding of which is essential to the commander's plan. (Army) 1. One of the nine principles of war: Direct every military action toward a clearly defined, decisive, and attainable objective. (FM 3-0) 2. A location on the ground used to orient operations, phase operations, facilitate changes of direction, and provide for unity of effort. (FM 3-90) See also decisive point; principles of war; target. (See page 7-32 for symbol.)
Observer/Controller	Combined arms subject-matter experts who observe and assess individual and collective training performance, teach and coach their unit counterparts, and provide training performance feedback. The O/C organization parallels that of the units undergoing training. This strategy ensures sufficient personnel to measure the performance of individuals and units in battle and collective tasks and to assist in scenario execution. The O/Cs accompany the unit throughout all phases of force-on-force and live-fire training.
Operational Availability	The percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission and can be expressed as (uptime / (uptime + downtime)).
Operational Requirements Document	Previously used to document the user's objective (desired) and threshold (minimum acceptable) level of requirements for operational performance of a proposed concept or system. Being phased out and replaced by the Capability Development Document (CDD).
Operational View	A facilitator of human communication intended for presentation to high-level decision makers of the operational domain and capabilities that a given system or set of systems is intended to support.

UNCLASSIFIED DRAFT

Term	Definition
Organic Assets	Assets organic to training unit or range control (DAC's or WG's)
Presentation Device	Target system PDs are comprised of a mix of Stationary Infantry Target (SIT), Stationary Armor Target (SAT), Moving Infantry Target (MIT), and Moving Armor Target (MAT). - FASIT CPD Briefing
Program Evaluation Group	PEGs program and monitor resources to perform Army functions assigned by 10 USC, Subtitle B – Army, and to support the combatant commands and OSD-assigned executive agencies. Each PEG administers a set of Management Decision Packages (MDEPs) within one of the following functional groupings: Manning, Training, Organizing, Equipping, Sustaining, and Installations. Each PEG, subject to existing program and budget guidance, sets the scope, quantity, priority, and qualitative nature of resource requirements that define its program. They monitor PEG resource transactions and, as required, make both administrative and substantive changes to assigned MDEPs. MDEP proponents, subject matter experts, and, as appropriate, representatives of commands and agencies participate in PEG deliberations. HQDA uses six Program Evaluation Groups (PEG) to support planning, programming, and budgeting.
Range Environment	MCTC, MTA, or Homestation range complex. Deployed area approved for live fire.
Range Fan	Left side, right side, and distance limitations placed on ranges based on ammunition and explosives.
Range Infrastructure	FOT range physical, data, power infrastructure and interfaces to parent facility infrastructure.
Range Network	Data link from range operating system to targetry through fiber optic data cables, copper data cables or a wireless network.
Range Operating System	Computer and/or server w/ OS that runs the range
Range Scenarios	Sequence of target activations primarily based on doctrine, however flexibility is available to Commanders.
Reconnaissance	A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. See FM 3-0. (See page 5-13 for symbol.)
Signatures	Visual, Infrared, thermal, and weapons effects signatures that can be sensed by humans and/or machines.
Standard	A formal agreement documenting generally accepted specifications or criteria for products, processes, procedures, policies, systems, and/or personnel.
Sustainable Range Program	The Army's overall approach for improving the way in which it designs, manages, and uses its ranges to meet its 10 USC mission training responsibilities. The SRP proponent, the ODCS G-3/5/7, defines SRP by its two core programs, the Range and Training Land

UNCLASSIFIED DRAFT

Term	Definition
	<p>Program (RTLTP) and the Integrated Training Area Management (ITAM) Program, which focus on the doctrinal capability of the Army's ranges and training land. To ensure the accessibility and availability of Army ranges and training land, the SRP core programs are integrated with the facilities management, environmental management, munitions management, and safety program functions supporting the doctrinal capability. Within the ATEC, SRP is defined by its test range and ITAM programs and is similarly integrated with the program functions supporting the doctrinal capability.</p>
System Threat Assessment Report	<p>The STAR is the basic authoritative threat assessment that supports the development and acquisition of a particular ACAT I, IA, or II system. The STAR contains an integrated assessment of projected enemy capabilities at initial operational capability (IOC) and IOC plus 10 years, to limit, neutralize or destroy the system. It explicitly identifies critical intelligence categories (CICs), which are a series of threat capabilities that could critically impact the effectiveness and survivability of the program. It is approved and validated in support of milestone decision reviews (MDRs). This report is the primary threat reference for the CDD, the modified integrated program summary (MIPS), the AoA, and the TEMP developed in support of a MDR. The STAR is approved by HQDA DCS, G-2 and validated by the Defense Intelligence Agency (DIA) for all ACAT I, IA, II and DOTE Oversight List programs at MS B and updated at MS C.</p>
System View	<p>A description of systems and interconnections in the DODAF providing for, or supporting, warfighting functions. SV describes how the multiple systems of the architecture will interface with each other, and the "internals" of individual systems, i.e., key nodes, circuits, networks, platforms etc. The SV associates physical resources allocated to the Operational View in accordance with the standards in the Technical Standards View.</p>
Tactical Electronic Countermeasures Environment	<p>For FOT training will be limited to threat emitters that stimulate aircraft counter measures (potentially ground platforms) in the future.</p>
Target Controller	<p>Control and sequence processes for the logical target.</p>
Targetry System	<p>targets and ancillary devices group</p>
Technical Standards View	<p>The TV provides the technical systems implementation standards upon which engineering specifications are based, common building blocks are established, and product lines are developed.</p>
Technical view	<p>An architecture view that describes how to tie the systems together in engineering terms. It consists of standards that define and clarify the individual systems technology and integration requirements.</p>
Unit Trend Data	<p>Average scores or average results by time, distance, type target, etc.</p>
Universal Target Controller	<p>US Government owned software used to control, troubleshoot, and provide AAR score sheets for targetry systems.</p>
Unmanned Aircraft System	<p>That system whose components include the necessary equipment,</p>

UNCLASSIFIED DRAFT

Term	Definition
	network, and personnel to control an unmanned aircraft. Also called UAS. (JP 3-52)
Unmanned Ground System	Unmanned Ground System (ref FASIT CPD) non-specific probably applies to (UGVS unmanned ground vehicle system, also a program of same name. Disambiguation Unmanned Ground Sensor term used by Future Combat Systems for unmanned deployable ground sensors.

1001
1002
1003

DRAFT

UNCLASSIFIED DRAFT

1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014

DRAFT