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# NENA Virtual PSAP Management Standard

**Abstract:** This document covers the technological, operational, human resources, and evolutionary requirements for expanding resources to meet the needs expected by the public for operating in a virtual environment.



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NENA Virtual PSAP Management Standard

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28 **1 Executive Overview**

29 A variety of options for alternate call processing models will expand in the Next Generation  
30 9-1-1 (NG9-1-1) environment. While technological and operational MUST be addressed, the  
31 number of agencies implementing some form of virtual Public Safety Answering Point  
32 (PSAP) operations will continue to expand. PSAP management MUST weigh the benefits of  
33 these options on how they positively impact the delivery of emergency service to the public  
34 they serve.

35 The theoretical notion of virtual PSAP operations evolved into a pandemic-borne reality in  
36 2020. The benefits of allowing call taking and radio operations from alternate sites,  
37 including employee residences, quickly proved beneficial on multiple levels.

38 Geo-diversity offers an additional level of reliability for PSAP management. Continuously  
39 operating from your primary and backup centers prevents equipment from falling into  
40 disuse and ensures needed updates to software occur. Moreover, any connectivity  
41 problems will be rapidly identified and remedied.

42 The ability to ramp up staffing to address unpredictable call surges can be more efficiently  
43 performed when key staff can utilize assigned equipment from home to help process calls.  
44 Additionally, for severe weather events, telecommunicators could help quickly increase  
45 staffing without having to place themselves on the road in hazardous conditions.

46 The staffing challenges that existed pre-pandemic and surged post-pandemic may be  
47 exasperated by the evolving challenges of NG9-1-1 technology. Allowing staff the option of  
48 working some shifts from home will create an incentive for continued employment in public  
49 safety communications. The flexibility of virtual work and the decreased living expenses of  
50 commuting to a traditional PSAP MAY alleviate some of these staffing challenges.

51 There have been valid objections to virtual work including concerns on IT issues, Critical  
52 Incident Stress Management (CISM) and Health Insurance Portability and Accountability  
53 Act (HIPAA) concerns, and teamwork issues. However, as we have seen agencies work  
54 through these issues the cost-benefit balance easily tips in favor of virtual operations that  
55 each PSAP MUST carefully evaluated.

56 **Table of Contents**

57 **1 EXECUTIVE OVERVIEW.....2**

58 **2 DOCUMENT CONVENTIONS.....6**

59 2.1 DOCUMENT TERMINOLOGY .....6

60 2.2 NENA INTELLECTUAL PROPERTY RIGHTS (IPR) AND ANTITRUST POLICY .....6

61 2.3 REASON FOR ISSUE/REISSUE .....7

62 **3 REASONS TO IMPLEMENT .....8**

63 **4 VIRTUAL PSAP .....8**

64 4.1 ASSESSMENT OF PSAP TASK VIRTUALIZATION .....9

65 4.2 ARCHITECTURE .....9

66 4.3 VIRTUAL ENVIRONMENT .....10

67 **5 TECHNOLOGY .....10**

68 **6 SECURITY .....11**

69 6.1 PHYSICAL SECURITY .....11

70 6.2 NETWORK SECURITY .....12

71 **7 COMMUNICATIONS .....12**

72 7.1 INTERNAL COMMUNICATIONS.....12

73 7.2 EXTERNAL COMMUNICATIONS .....13

74 7.3 DEDICATED TALK GROUPS .....13

75 **8 HUMAN RESOURCES.....13**

76 8.1 RECRUITMENT.....13

77 8.2 EMPLOYEE SELECTION.....14

78 8.3 HIRING PRACTICES .....15

79 8.4 MANAGEMENT OF VIRTUAL FUNCTIONS.....16

80 **9 COLLECTIVE BARGAINING .....16**

81 **10 STAFFING.....17**

82 **11 SHIFT OPERATIONS.....18**

83 **12 TRAINING .....19**

84 12.1 TRAINING OBJECTIVES.....19

85 12.2 TRAINING ENVIRONMENTS .....20

86 **13 RETENTION.....20**

87 **14 TEAMWORK.....21**

88 **15 PERFORMANCE .....22**

89 15.1 EMPLOYEE APPRAISAL AND REVIEW .....22

90 **16 MENTAL HEALTH, WELLNESS, AND PEER SUPPORT .....24**

91 **17 CONTINUITY OF OPERATIONS PLANNING.....25**



---

92	<b>18</b>	<b>SUPERVISORY MANAGEMENT</b> .....	<b>26</b>
93	<b>19</b>	<b>MANAGEMENT SKILLS</b> .....	<b>27</b>
94	<b>20</b>	<b>CONCLUSION</b> .....	<b>29</b>
95	<b>21</b>	<b>IMPACTS AND CONSIDERATIONS</b> .....	<b>29</b>
96	21.1	OPERATIONS IMPACTS SUMMARY .....	29
97	21.2	TECHNICAL IMPACTS SUMMARY .....	30
98	21.3	SECURITY IMPACTS SUMMARY .....	30
99	21.4	RECOMMENDATION FOR ADDITIONAL DEVELOPMENT WORK .....	30
100	21.5	ANTICIPATED TIMELINE .....	30
101	21.6	COST FACTORS .....	30
102	<b>22</b>	<b>ABBREVIATIONS, TERMS, AND DEFINITIONS</b> .....	<b>31</b>
103	<b>23</b>	<b>REFERENCES</b> .....	<b>35</b>
104		<b>ACKNOWLEDGEMENTS</b> .....	<b>35</b>
105		<b>SPECIAL ACKNOWLEDGEMENTS:</b> .....	<b>36</b>
106			
107			



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112 This Standard Document (STA) is published by the National Emergency Number Association  
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145 **2 Document Conventions**

146 **NENA: The 9-1-1 Association** improves 9-1-1 through research, standards development,  
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148 secure through universally available state-of-the-art 9-1-1 systems and better trained 9-1-1  
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150 **2.1 Document Terminology**

151 This section defines keywords, as they should be interpreted in NENA documents. The form  
152 of emphasis (UPPER CASE) shall be consistent and exclusive throughout the document.  
153 Any of these words used in lowercase and not emphasized do not have special significance  
154 beyond normal usage.

- 155 1. **MUST, SHALL, REQUIRED:** These terms mean that the definition is a normative  
156 (absolute) requirement of the specification.
- 157 2. **MUST NOT:** This phrase, or the phrase "SHALL NOT", means that the definition is an  
158 absolute prohibition of the specification.
- 159 3. **SHOULD:** This word, or the adjective "RECOMMENDED", means that there may exist  
160 valid reasons in particular circumstances to ignore a particular item, but the full  
161 implications must be understood and carefully weighed before choosing a different  
162 course.
- 163 4. **SHOULD NOT:** This phrase, or the phrase "NOT RECOMMENDED", means that there  
164 may exist valid reasons in particular circumstances when the particular behavior is  
165 acceptable or even useful, but the full implications should be understood and the  
166 case carefully weighed before implementing any behavior described with this label.
- 167 5. **MAY:** This word, or the adjective "OPTIONAL", means that an item is truly optional.  
168 One vendor may choose to include the item because a particular marketplace  
169 requires it or because the vendor feels that it enhances the product while another  
170 vendor may omit the same item. An implementation which does not include a  
171 particular option "must" be prepared to interoperate with another implementation  
172 which does include the option, though perhaps with reduced functionality. In the  
173 same vein an implementation which does include a particular option "must" be  
174 prepared to interoperate with another implementation which does not include the  
175 option (except, of course, for the feature the option provides.)

176 These definitions are based on IETF RFC 2119 [2].

177 **2.2 NENA Intellectual Property Rights (IPR) and Antitrust Policy**

178 NOTE – The user's attention is called to the possibility that compliance with this standard  
179 may require use of an invention covered by patent rights. By publication of this standard,  
180 NENA takes no position with respect to the validity of any such claim(s) or of any patent

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### 196 **2.3 Reason for Issue/Reissue**

197 NENA reserves the right to modify this document. Upon revision, the reason(s) will be  
198 provided in the table below.

Document Number	Approval Date	Reason For Issue/Reissue
NENA 53-507	May 26, 2009	Initial Document
NENA-INF-025.2-2017	December 21, 2017	This document was updated and reissued by NENA to ensure content was current with industry changes and advancements made since the original issue date.
NENA-STA-046.3-2025	May 27, 2025	Initially an information document this is a revision to an ANSI standard.

199

200 **3 Reasons to Implement**

201 Today's PSAP environment primarily consists of two main core functions: call handling and  
202 radio communications.

203 The Working Group discussion identified a number of challenges to current PSAP  
204 operations that might benefit from addressing issues in new ways in the future PSAP  
205 environment. Challenges such as:

- 206 • PSAPs increasingly have difficulty finding enough qualified people.
- 207 • PSAPs are costly to set up and run.
- 208 • PSAP space, structure, and resources are not easily scalable.
- 209 • PSAPs cannot always easily accommodate unpredictable demand.
- 210 • PSAPs do not reflect the employee's desires for a flexible work environment.
- 211 • PSAPs have difficulty retaining qualified people.

212 Finding successful and efficient ways to solve some of these challenges using virtual  
213 workers in the PSAP presents significant opportunities for management. Research in the  
214 private sector has demonstrated saving on physical space, potential cost savings, effective  
215 response to erratic call volume, and overcoming the employee retention problems that  
216 plague PSAPs today.

217 One of the initial questions discussed by the Working Group was why consider a "virtual"  
218 option for the PSAP environment? What might be the advantages or challenges to such an  
219 implementation?

220 Modern information technology has made effective and efficient virtual work possible, and  
221 today's employees expect virtual work as an option. But are those sufficient reasons to  
222 implement it? If virtual work is going to become part of a successful public safety strategy,  
223 there needs to be significant planning and adjustments to operational policies in order to  
224 accommodate the changing work environment.

225 What benefits can be expected from moving to a virtual work program and what resources  
226 will be required? It is important for decision-makers to have a full understanding of the  
227 drivers, benefits, challenges, opportunities, and the relationship between and among these  
228 factors, including potential liability, regulatory requirements, security, network connectivity,  
229 and privacy issues. Otherwise, well-intentioned action can result in confusion and  
230 unachievable expectations for the organization and stakeholders, as well as errors in  
231 planning, program promotion, and other implementation activities.

232 **4 Virtual PSAP**

233 What is a virtual PSAP? The concept of a virtual PSAP ranges from having employees  
234 working off-site, standing up multiple traditional physical PSAP locations, or sharing remote  
235 and/or centralized resources. With today's environment and technological advances, the  
236 need for a virtual PSAP could range from employees handling tasks off-site to managing

237 and overseeing selected PSAP operations outside of the traditional PSAP. When preparing  
238 continuity of operations plans, virtualization could enable the PSAP to continue to function  
239 in alternative locations.

#### 240 **4.1 Assessment of PSAP Task Virtualization**

241 PSAP management SHOULD conduct a needs assessment to evaluate the different  
242 operational tasks that are currently being performed or will be performed in the future  
243 within their emergency communications center to determine if they are mission-critical  
244 tasks and SHOULD be performed internally, or if the task could be virtualized. PSAP  
245 management will need to weigh the risks, benefits, privacy, and liability of having that  
246 task(s) virtualized.

247 The needs assessment SHOULD identify the applications, tools, security, technological and  
248 human resource elements including skills that would be required to perform the task(s),  
249 and the supporting supervisory methods and skills necessary to manage virtual workers'  
250 performance. Remote workers will have access to sensitive or protected data outside of a  
251 controlled environment that is otherwise covered under statutes or policies (e.g., HIPAA  
252 and CJIS).

253 Additional considerations and/or policies will need to be undertaken regarding how to  
254 address the legal issues that can arise with remote workers. This could require periodic on-  
255 site inspections of remote work environments, as well as remote monitoring tools to track  
256 employee activity and data that they access. Regionally, PSAP management can evaluate  
257 consolidating or virtualizing mission-critical tasks such as 9-1-1 call processing. When  
258 virtualizing mission-critical tasks in a region, the need to have local knowledge of the  
259 region should be a consideration.

#### 260 **4.2 Architecture**

261 Virtual infrastructure will need to be common and shared. Hosted applications will need to  
262 be replicated at the virtual sites for consistency of operations and redundancy. PSAPs will  
263 need to continue to evolve with NG9-1-1 technologies that will support their operations.  
264 Virtual workers will need to be able to securely access the emergency services network(s),  
265 software applications, and critical functions hosted at the main PSAP.

266 IT networks for the virtual environment SHOULD NOT rely on the physical PSAP  
267 infrastructure. The architecture SHOULD be cloud-based with geo-redundant data storage  
268 facilities. PSAPs SHOULD consider a physical backup server in addition to geo-redundant  
269 cloud storage. Accessibility to the systems SHOULD be secure and accessible from  
270 approved locations. Access SHOULD be within approved role-based access control.

### 271 **4.3 Virtual Environment**

272 Virtual PSAP operations will need to run in an IP environment. PSAP management needs to  
273 be aware of the legislative or governmental mandates when designing a virtual PSAP such  
274 as restrictions in regard to hosting data off-site, proof of chain of custody, and CJIS  
275 compliance.

276 Call answering can occur locally, regionally, or off-site from an individual's home. Call  
277 routing in this environment can be redirected to the telecommunicator's location. Different  
278 call routing protocols could be set based on the continuity of operations. The virtual  
279 environment provides countless opportunities and challenges.

280 Beyond the individual PSAP operating in their own virtual environment, NG9-1-1 creates  
281 the opportunity to regionalize 9-1-1 call taking. PSAPs can work together utilizing virtual  
282 workers to assist in overflow call situations such as PSAP A can find itself in an overflow  
283 condition where virtual workers in the region could be able to absorb the overflow.

284 For shared staff situations, challenges can be present, and consideration SHOULD be given  
285 to the technology used, Standard Operating Procedures (SOPs), and call-handling duties.  
286 Specific examples include, but are not limited to:

- 287 • Recording and logging of calls
- 288 • Call routing
- 289 • Geographic Information System (GIS) routing
- 290 • Local knowledge in a regional setting
- 291 • Shared funding and governance in a cooperative virtual environment
- 292 • CAD-to-CAD infrastructure

## 293 **5 Technology**

294 The integration of a virtual PSAP component as a functional element in the 9-1-1  
295 emergency response environment will not occur as easily as flipping a switch. This  
296 integration will occur incrementally, based on best practices from other disciplines and  
297 industries, to guide the development of procedures and applications, and to ensure  
298 consistency of technological applications.

299 The identification of the underlying technological requirements is a critical step in  
300 advancing the concept of a virtual PSAP and making it a reality. Technology is a broad  
301 concept, and it is important to consider the architecture of the systemic infrastructure and  
302 related processes and applications that will provide the tangible structure for the concept of  
303 a virtual PSAP. Fundamentally, this means an open-architecture, application-based system,  
304 utilizing an IP network or backbone, which is often described by the 9-1-1 community as an  
305 Emergency Services IP Network (ESInet). At a minimum, the technological requirements of  
306 a virtual PSAP will mandate easy access to information, providing a secure and fluid  
307 transfer between alternate locations and on-site PSAP operations.

308 Although technology is an enabling tool, it also has inherent limitations. Establishing a  
309 virtual PSAP in a geographically diverse landscape can present connectivity challenges  
310 related to broadband availability and bandwidth limitations. Furthermore, as the 9-1-1  
311 community develops a greater understanding and a clearer picture of the concept of a  
312 virtual PSAP, the technological requirements will evolve. Technology changes and evolves  
313 rapidly, so it MUST be thoroughly tested and trialed to ensure quality and redundancy  
314 before any new virtual PSAP technology is widely deployed. The testing SHOULD include,  
315 but not be limited to, call processing, how ANI/ALI spills into Computer Aided Dispatch  
316 (CAD) and mapping products, consideration of dropped or disconnected calls for service,  
317 audio recording, and screen capture.

318 This technology SHOULD also complement Next Generation 9-1-1, as well as co-exist in a  
319 legacy 9-1-1 environment. And finally, virtual PSAP technology SHOULD guarantee  
320 interoperability and allow for resource sharing that provides procurement economies of  
321 scale and regional equity from a cost-benefit standpoint.

## 322 **6 Security**

323 Just as security is a major concern for the traditional PSAP, it is equally important to  
324 consider security when implementing a virtual PSAP. In the virtual PSAP, security breaches  
325 could now have consequences for multiple locations or networks, including the overall  
326 health of the ESInet on a regional or global scale. It is essential for PSAP managers to  
327 develop policies and procedures that address both physical and network security in the  
328 virtual environment.

329 When considering a virtual PSAP, and thus an “Answer from Anywhere” situation, it  
330 becomes even more important to ensure there are documented policies for physical and  
331 network security. As the business or entity can no longer control parts of this security, it is  
332 necessary to place some of this burden on the telecommunicator.

### 333 **6.1 Physical Security**

334 Even though a PSAP MAY be established in a virtual environment, there are still likely to be  
335 physical elements that need to be secured:

- 336 • PSAP managers MUST make policies to ensure confidential information is not  
337 released, accidentally or otherwise, by the nature of the telecommunicator’s  
338 location. This would include not allowing call taking in a public location (no internet  
339 cafes, libraries, etc.), ensuring any computer system or documents are outside of  
340 public visibility (i.e., information SHOULD not be in view of a public-facing window),  
341 and that physical media is kept secure when not actively in use (lock boxes, locked  
342 file cabinets, etc.).
- 343 • Access to equipment and server rooms within traditional PSAPs MUST be limited to  
344 personnel on an as-needed basis only.

- 345 • Third-party vendors and contractors MUST be escorted at all times.
- 346 • Servers or network components housed at off-site locations MUST be secured and
- 347 monitored with the same limited accessibility as the traditional PSAP.
- 348 • Access to Cloud-based infrastructure SHOULD be limited to personnel on an as-
- 349 needed basis only.
- 350 • If utilized, alternate sites SHOULD be placed in secure locations with access control
- 351 and video monitoring systems in place when practical.
- 352 • Personnel operating virtually in a private residence MUST take steps to safeguard
- 353 computers, radios, and other equipment from unauthorized access and use. These
- 354 safeguards MUST be regularly audited.

## 355 **6.2 Network Security**

356 Network security presents the same challenges but with different resolutions. Policy MUST  
357 ensure that telecommunicators are not utilizing public or unsecured networks like free Wi-Fi  
358 access points, unsecured personal Wi-Fi, or shared internet that the telecommunicator is  
359 not in control of (e.g., multi-tenant situations) for work purposes. Additionally,  
360 telecommunicators SHALL NOT utilize public safety networks for personal use.

361 PSAPs operating in a virtual environment SHOULD assess any risks, vulnerabilities, and the  
362 likelihood of an occurrence leading to a threat. The FCC’s Task Force on Optimal Public  
363 Safety Answering Point Architecture (TFOPA) or Task Force report, available at  
364 <https://www.fcc.gov/document/fcc-releases-tfopa-final-report>, identifies four use cases  
365 that provide public safety entities with better situational awareness, creates a focus on  
366 cybersecurity, and encourages immediate action on the part of 9-1-1 Authorities, PSAPs,  
367 and public safety entities in both educating their personnel and protecting their networks  
368 and systems. PSAP managers are encouraged to consult this document and other available  
369 resources when creating secure network environments.

370 PSAP management accessing law enforcement databases will need to consult their state  
371 and local administrators to comply with regulations specific to their state.

## 372 **7 Communications**

373 PSAP Managers need to consider how internal and virtual environment communications will  
374 be conducted, acknowledged, and tracked for compliance. Measures SHOULD be taken to  
375 ensure comprehension of rules and expectations by all staff.

### 376 **7.1 Internal Communications**

377 Tools used for internal communications SHOULD be designed to include those working  
378 remotely. Examples include incident sharing, broadcast messages, pass-on logs, and daily  
379 briefing information, etc. Virtual workers need to have a direct line of communication to  
380 supervisors for support, questions, clarification, etc. Secure chat rooms MAY also be  
381 beneficial so staff can bond while discussing issues. Multiple virtual rooms may be assigned

382 for specific tasks as well as larger ones for the entire team. Non-secure chat rooms MAY be  
383 utilized for internal communications of a non-sensitive nature. All chat rooms SHOULD be  
384 monitored, and expectations of professionalism and respect in the content heavily  
385 enforced.

## 386 **7.2 External Communications**

387 When communicating with surrounding agencies or the public, plain language and  
388 standardized definitions SHOULD be utilized to ensure a common understanding.

## 389 **7.3 Dedicated Talk Groups**

390 When available, talk groups SHOULD be created for PSAP communications both internally  
391 and externally. Talk groups SHOULD be created for particular tasks within a PSAP and for  
392 communicating with neighboring PSAPs.

## 393 **8 Human Resources**

394 PSAP managers will need to revise policy manuals to address changes in expanding to a  
395 virtual work environment. Moreover, all documents related to job descriptions, quality  
396 assurance, KPIs, employee performance evaluations, collective bargaining agreements,  
397 onboarding, and separations will need to be thoroughly reviewed. Recruitment and testing  
398 procedures will need to include potential new hires being assigned remote work. Just as  
399 employers need to perform due diligence with proper background investigations for  
400 recruits, some adjustments will need to be made in consideration of the different potential  
401 liability issues associated with remote work.

### 402 **8.1 Recruitment**

403 Finding successful employees is one of the biggest challenges for the traditional PSAP  
404 manager. As stated in Section 8.2 Employee Selection below, the consensus is that primary  
405 or initial recruitment SHOULD be for the "on-site" PSAP. Individuals placed in the virtual  
406 PSAP environment would most likely be experienced or established telecommunicators.

407 Being chosen to work in the virtual PSAP environment could be seen as an incentive or  
408 preferential shift assignment that employees potentially could compete.

409 The virtual PSAP environment MAY open doors to a new pool of candidates. With the  
410 incorporation of virtual workers, the hiring pool can potentially be expanded throughout the  
411 United States. Virtual workers can take their job with them when traveling or if they move.  
412 This type of employment is ideal for military spouses, retirees, disabled persons, or people  
413 who are unwilling or unable to relocate. State laws MUST be consulted for any restrictions  
414 on employment and work performed across state lines.

415 A common practice in emergency communications has traditionally been to employ people  
416 from the local community. An emphasis on local community understanding and awareness

417 is acknowledged to be critically important for effective 9-1-1 operations. However, staffing  
418 challenges could dictate the need to expand recruitment efforts outside of the local area.

419 Virtual work would open the candidate pool to emergency communications retirees and  
420 telecommunicators from other jurisdictions looking for competitive work shifts or special  
421 assignments that would normally not be targeted in a standard recruitment procedure.  
422 Also, the current and upcoming generations are more receptive to off-site work  
423 opportunities that involve state-of-the-art technologies.

## 424 **8.2 Employee Selection**

425 Although the technology that supports virtual workers gets most of the attention on the  
426 subject of virtual teams, it is really the changes in the nature of teams—not their use of  
427 technology—that create new challenges for managers and PSAP employees. Most “virtual”  
428 teams operate in multiple modes including having face-to-face meetings when possible.  
429 Managing a virtual team means managing the whole spectrum of communication strategies  
430 and project management techniques as well as human and social processes in ways that  
431 support the work team.

432 The traditional elements or traits often considered in hiring a 911 Telecommunicator will  
433 probably not change drastically in a virtual environment. In the Working Group discussion,  
434 there was general agreement that, first and foremost, the agency SHOULD look to hire  
435 individuals who can work in the traditional “brick and mortar” or on-site PSAP. The initial  
436 telecommunicator training SHOULD still occur in the traditional setting with hands-on  
437 training on the live dispatch floor. It is anticipated that before an individual would be  
438 approved to work virtually, they would demonstrate proficiency in the traditional on-site  
439 PSAP environment.

440 Currently, some PSAP employers do not place a priority on the ability to work  
441 independently or the ability to self-pace the workday. With that said, job description search  
442 profiles MAY need to be slightly expanded to include these skillsets. Daily PSAP operations  
443 involve a great deal of teamwork and reliance on direct supervision of shift operational  
444 priorities during peak call times and critical incidents.

445 To work in a virtual environment, it would be very beneficial to have confident,  
446 experienced employees with the ability to work independently. These individuals SHOULD  
447 also be capable of pacing their workload. Additionally, it will be helpful to have employees  
448 who possess a better than “basic” technology skillset. They will be interfacing with  
449 streaming video, text to 9-1-1, third-party applications, and monitoring social media while  
450 maintaining the operational condition of local computer hardware/software. Awareness of  
451 other peripherals will also be necessary. The tools available in the on-site physical PSAP will  
452 also need to be available to the virtual PSAP worker.

453 When selecting employees for a virtual workforce, PSAP management SHOULD consider at  
454 a minimum the following requirements:

- 455 • Self-motivation
- 456 • Self-discipline and initiative
- 457 • Strong organizational and time management skills
- 458 • Ability to work alone and independently with minimal supervision and feedback
- 459 • Success in their current position
- 460 • Compliance with the organization's policies and procedures
- 461 • An understanding of the effect of their participation in the program on other
- 462 employees
- 463 • Effective communication skills and the ability to be a team player
- 464 • Access to a safe, comfortable remote worksite where it is easy to concentrate
- 465 • Compliance with a mandatory level of security
- 466 • Ability to independently comprehend and implement frequently changing technology

467 Finally, consideration SHOULD be given to testing virtual PSAP candidates for work ethic  
468 and commitment.

### 469 **8.3 Hiring Practices**

470 PSAPs and their supporting Human Resource departments will need to evaluate existing job  
471 descriptions for essential functions impacted by a virtual work environment. Multiple job  
472 descriptions MAY be needed to accommodate unique sites (i.e., home, off-site PSAP, or  
473 satellite offices) and identify specific job requirements required for independent work.

474 Some examples to consider are as follows:

- 475 • Approving off-site location for virtual assignment
- 476 • Specifying equipment requirements, security, and maintenance
- 477 • Expanding computer literacy requirements
- 478 • Requiring remote work Memorandum of Understanding (MOU) if working from home
- 479 • Providing accommodation for Americans with Disabilities Act (ADA) if necessary

480 When PSAP management is hiring specifically for a virtual position, the questions and  
481 scoring criteria for the applicant will need to be tailored for the specific position.  
482 Consequently, the skills and demeanor, work ethic, and independence of the applicant MAY  
483 all be considered as highly acceptable qualities for the virtual position. As stated earlier in  
484 the document, if the ability to work in a virtual environment is going to be considered a  
485 promotional aspect or one that an employee earns, perhaps nothing in the hiring or  
486 screening process needs to change.

487 Work rules SHOULD be modified as the situation warrants. When the worker displays  
488 essential qualities to the supervisor and/or manager of the PSAP and it has been  
489 determined to be in the best interest of everyone to advance the concept of virtual work,  
490 other factors MAY need to be considered such as an MOU.

491 Considerations to include in a remote work MOU MAY consist of the following:

- 492 • Site specifications for supporting remote access
- 493 • Security and information privacy within the remote work environment
- 494 • Random site visits for inspection purposes
- 495 • Remote monitoring, which could include video
- 496 • Responsibilities of the employer, responsibilities of the employee, expectations, etc.

#### 497 **8.4 Management of Virtual Functions**

498 PSAP management MUST consider a method of managing operational functions in a virtual  
499 environment. Considerations include but are not limited to the following:

- 500 • Quality Assurance/Quality Improvement (QA/QI) (e.g., random review of calls and  
501 dispatching incidents to include call answer time, call processing, customer service,  
502 call/data entry, and dispatch performance)
- 503 • Adherence to policies and procedures
- 504 • Scheduling/Payroll
- 505 • Shift management (e.g., review daily observation reports, workflow, and routine and  
506 emergency staff notifications)
- 507 • Performance Appraisals
- 508 • Training
- 509 • Investigate reported inquiries and complaints
- 510 • Corrective action

### 511 **9 Collective Bargaining**

512 PSAPs with union employees MAY have special challenges and opportunities with the virtual  
513 PSAP concept that would have to be addressed before a virtual PSAP could be  
514 implemented. As unions contemplate the effect virtual work can have on their union  
515 members, they will likely be concerned about the ability to represent their members and  
516 will be seeking a clear definition of the role of the union in implementing alternate work  
517 environments.

518 In the past, union leaders have possibly struggled with employers who attempted  
519 unplanned, informal virtual work programs through an essentially arbitrary selection  
520 process. It is likely that union leaders will want to know early on how the union will be  
521 involved in planning, implementing, and monitoring virtual work programs. They may even  
522 desire to be involved in developing the criteria for who is selected or approved to work  
523 virtually. Their involvement MAY help assure their members that the criteria have been  
524 developed in a fair and equitable way, and that the selection of who is permitted to work  
525 virtually is conducted by an agreed upon-process. The federal government requires  
526 agencies to develop alternate location work programs in partnership with unions and other  
527 stakeholders since such work affects conditions of employment. That same model MAY well  
528 be translated to the local level in order for virtual work relationships to succeed.

529 For example, unions can sponsor information sessions on virtual work that are open to  
530 employees at every level of the PSAP organization. Employers in both public and private  
531 sectors who have successfully implemented a virtual work plan can be invited to discuss  
532 the benefits and challenges of the programs. If a virtual work program is to succeed, all  
533 staff SHOULD be comfortable with the process. The union can facilitate this together with  
534 management and supervisory counterparts. Inquiries by unions on specific processes MAY  
535 need to be contemplated as part of the planning and evaluation analysis conducted by the  
536 PSAP manager.

537 Some possible considerations to prepare to address include the following:

- 538 • Fairness and equity in the selection process for virtual work
- 539 • Fairness and equity in supervision, work schedules, and performance evaluations
- 540 • Personnel-related aspects of management
- 541 • Compensation issues including pay and benefits
- 542 • Acceptance of electronic monitoring such as video cameras that are necessary for  
543 staffing oversight in a virtual environment

544 Anything that exists today in a PSAP's employment rules and regulations, including policies  
545 and procedures, MAY require re-evaluation by both management and union  
546 representatives. Virtual work can be a win-win proposal if done correctly. Both union  
547 leadership and management will need to work to alleviate local resident and political  
548 concerns regarding perceptions that virtual work hinders supervision, and therefore  
549 facilitates ineffectiveness and imbalance of workload. All of those issues can and need to  
550 be addressed by the PSAP management in the supervision and monitoring processes and  
551 by providing the appropriate technology to achieve performance expectations.

552 PSAP managers SHOULD consider that virtual working is part of the technological wave of  
553 the 21<sup>st</sup> century and it can be beneficial to residents and workers alike, but it MUST provide  
554 seamless coverage in support of the quality services that the public has come to expect  
555 from its dedicated public employees.

## 556 **10 Staffing**

557 Staffing is about how to fulfill the requirements of PSAP operations by having the right  
558 number of personnel. To meet these staffing needs and to establish consistent  
559 expectations, it is recommended that PSAPs establish a set schedule for virtual workers or  
560 assign virtual workers specific shifts.

561 Table 10-1 identifies some specific areas where the virtual operation differs from the  
562 physical presence of an employee located within a physical facility.

563

**Table 10-1 Staffing Differences**

	<b>Physical</b>	<b>Virtual</b>
<b>Attendance</b>	We can visually see an employee arriving late, leaving early, or taking excessive breaks.	Attendance can be tracked virtually by monitoring software and instant messaging that tracks real-time online status and type of device.
<b>Scheduling</b>	Schedules and shift openings SHOULD be posted in the PSAP (either physically or digitally) where all employees can view and sign up for overtime and post requests for vacation coverage and shift swaps.	PSAPs can utilize applications and technology to virtualize staff scheduling, facilitating shift sign-ups and vacation bids. These applications can be used to schedule both on-site and virtual workers.  In addition, applications could be used to contact employees to cover last-minute shortages and/or during emergency situations to work virtually or on-site.

564

565 PSAP managers SHOULD continue to assess data such as call answer times, processing  
 566 times, and overall performance after transitioning to a virtual work environment to analyze  
 567 scheduling needs. PSAPs utilizing the virtual environment SHOULD ensure they have access  
 568 to monitoring and analytical software applications that can track and measure call volume,  
 569 telecommunicator availability, answer, and processing times, etc.

570 Another challenge is staff mobilization. It is not uncommon for a traditional PSAP worker  
 571 who does not want voluntary or mandated overtime to ignore the request for overtime  
 572 when it is sent. This issue can remain when trying to fill unexpected open shifts with virtual  
 573 workers. It is recommended that PSAPs establish a policy for scheduling and issuing  
 574 overtime that applies to both virtual and traditional PSAPs.

575 PSAP managers SHOULD be aware that a virtual workforce does not necessarily solve all  
 576 the staffing problems that exist today, and the level of supervision will not be the same in  
 577 the virtual environment. However, PSAP managers MAY find benefits in allowing the next  
 578 generation of workers greater flexibility in staffing using a virtual environment in  
 579 conjunction with traditional PSAPs.

580 **11 Shift Operations**

581 One of the biggest challenges will be control of and communication with the virtual PSAP  
 582 employee. In a traditional PSAP environment, the physical presence of an employee can  
 583 facilitate communications within the agency and aid in the daily control of operations. In

584 the virtual environment, the visual cues that managers and supervisors rely on will not be  
585 readily available.

586 There can be simple solutions to the points mentioned above. Utilizing new and existing  
587 technologies can assist the manager with many of the virtual staffing oversight issues. For  
588 example:

- 589 • **Hardware** – Webcams at the virtual worker’s location could monitor their presence  
590 at a workstation and the physical location of where the work is being performed.  
591 During long or odd shift hours, being able to see a virtual worker can help the  
592 manager monitor for fatigue and distractions.
- 593 • **Software** – Software solutions that allow for instant text messaging, video, and  
594 audio conferencing can facilitate “roll call” meetings or dissemination of vital  
595 information that could be needed daily for each shift. Workstation status monitoring  
596 software can be used to track workstation status such as call taking availability, call  
597 processing time, and to assist management in the assessment of overall  
598 performance.

## 599 **12 Training**

600 Understanding the importance that training plays and a commitment to providing training  
601 on how to operate in a virtual PSAP will be essential to the success of implementing a  
602 virtual work environment. An initial training program designed around the virtual work  
603 environment SHOULD be considered to provide telework information to both managers and  
604 employees, focusing on addressing policies and procedures unique to the virtual  
605 environment including information security and vulnerability, IT operation and  
606 maintenance, maintaining effective communication with managers and co-workers, and any  
607 new liability risks. It will be important to demonstrate that both managers and employees  
608 are “in it together” and mutually responsible for success.

### 609 **12.1 Training Objectives**

610 Training objectives for virtual work SHOULD include, but are not limited to, the following:

- 611 • Demonstrate a comprehensive understanding of adapted call processing  
612 procedures/protocols while operating virtually.
- 613 • List and explain personnel and operational policies and procedures pertaining to  
614 virtual operations, highlighting differences from on-site operations.
- 615 • Demonstrate the knowledge and ability to operate and potentially troubleshoot  
616 specialized equipment, software, and systems that are used to support a virtual  
617 PSAP such as portable radios, mobile data terminals, and instant messaging  
618 software.
- 619 • Demonstrate the ability to operate at alternate locations.

- 620 • Demonstrate an understanding of the mental health stresses related to working in a  
621 PSAP and how this could increase while operating virtually.
- 622 • Identify how to recognize the signs of distress in oneself and others, which could  
623 present challenges in the remote working environment.
- 624 • Identify mental health resources and healthy coping mechanisms suited to support a  
625 virtual workforce.

## 626 **12.2 Training Environments**

627 It is recommended that initial training be conducted on-site in the PSAP; this SHOULD  
628 include a combination of both classroom and on-the-floor training. Virtual continuing  
629 education can be flexible and scheduled as needed. Using available technology for training  
630 is important for the success of training and performance. Time and money MUST be  
631 allocated for training. It will be challenging to make sure everyone on-site and virtual stays  
632 updated with technology hardware and software changes.

633 Virtual training can either be instructor led, with other students attending in real time, or  
634 can be on demand where students learn at their own pace. Just like a classroom training  
635 plan, virtual training sessions SHOULD incorporate training blocks with sufficient breaks.  
636 Opportunities for participants to interact with other students and the instructor SHOULD be  
637 provided. A virtual worker MAY take the initiative to learn in larger blocks if the virtual  
638 PSAP's call volume allows for additional training. On-site training SHOULD be scheduled at  
639 regular intervals to provide the opportunity to get everyone together in person. It will be  
640 important to document all training on a regular basis.

## 641 **13 Retention**

642 Employee retention could perhaps be one of the significant benefits of a virtual PSAP  
643 environment. Some of the most common reasons for job dissatisfaction leading to  
644 employees leaving their jobs are uncomfortable work environments, work hours, pay,  
645 commute times, and stress levels. The virtual PSAP can address some of these issues and  
646 thereby aid in staff retention. Working at home or in a more localized satellite location can  
647 address the issue of an uncomfortable work environment. The ability to "come to work" in  
648 casual clothing instead of a uniform could undoubtedly increase the comfort level of some  
649 individuals. Alleviating the need to be in the physical proximity of a co-worker an employee  
650 has a conflict with might also negate some workplace concerns and lower stress levels.

651 Work hours and pay concerns MAY also be accommodated. Shorter commute times,  
652 reduced meal expenses, and lack of special clothing expenses could result in higher net pay  
653 for these employees, even if the pay rate is identical to or lower than the traditional PSAP  
654 telecommunicator.

655 Finally, employees lost to retirement and life changes (e.g., moving, needing to care for a  
656 child/elder, preferring part-time) MAY be able to be retained in a virtual PSAP environment.

657 Being able to work a more flexible schedule, only during peak hours, or only during special  
658 assignments could keep these already trained individuals on the payroll to assist during  
659 times when it is difficult to staff with full-time employees.

## 660 **14 Teamwork**

661 PSAP management is encouraged to consider if the organization is best positioned to  
662 implement a comprehensive virtual work program and if it has sufficient organizational  
663 maturity, including a culture of teamwork and collaboration that can support it.

664 For virtual teams to work effectively, consider these axioms:

- 665 • Teamwork is fundamentally social, therefore, PSAP managers and teams will need to  
666 work to support social networking and seek opportunities to incorporate team-  
667 building exercises into regular operations such as team training and briefings.
- 668 • Knowledge is integrated into the life of teams and needs to be made explicit.
- 669 • It is important to create ways for team members to experience membership.
- 670 • Knowledge depends on engagement in practice; people gain and retain knowledge  
671 from observation and participation.
- 672 • Engagement is inseparable from empowerment.
- 673 • "Failure" to perform is often the result of exclusion from the development process.

674 It is not easy to keep up the motivation levels of team members from different cultures and  
675 work environments who lack face-to-face interaction. The camaraderie and spirit that  
676 makes such a difference to teamwork is also missing. However, the advances of new  
677 technologies and networking capabilities have introduced a new virtual teamwork  
678 environment.

679 Initial training for new employees SHOULD be held at the physical PSAP to gain an  
680 understanding of how public safety operates and establish co-worker relationships; this will  
681 aid in teamwork down the road. There MAY also be group training sessions where both  
682 new and tenured telecommunicators can gain trust in each other to aid in team building.  
683 Virtual briefings at the beginning of each shift can be helpful, keeping in mind they would  
684 need to be more detailed. A secure virtual meeting space for specific employee groups can  
685 also be beneficial to allow for bonding while discussing issues. Secure chat rooms SHOULD  
686 be used for professional purposes only and monitored and logged by the PSAP  
687 management.

688 Organizations SHOULD consider the importance of investing in technologies that will help  
689 virtual workers feel connected to the agency and their peers. More of an effort might need  
690 to be made to help members of the team in a virtual setting.

691 **15 Performance**

692 PSAP management with virtual employees will need to monitor their performance as  
693 diligently as those who work on-site. The traditional model, where supervisors are on-site  
694 where they can see telecommunicators face-to-face and can coach appropriately, already  
695 has limits due to the span of control. A fully virtual environment adds to this challenge as a  
696 supervisor's ability to observe calls, assist with questions, and visually manage personnel is  
697 restricted. Alternatively, when operating virtually through remote locations and alternative  
698 sites, a supervisor's visibility into an on-site worker's performance could be limited to  
699 monitoring from a distance within the PSAP floor or listening to calls and radio traffic from  
700 a command center.

701 PSAP managers SHOULD consider additional on-site supervision when operating these  
702 remote locations or alternate sites with multiple telecommunicators. This will better support  
703 their ability to help with questions, provide coaching, and identify performance issues. For  
704 a fully virtual environment or when supervising on-site is not an option, PSAPs SHOULD  
705 leverage evolving communication technologies that can assist in facilitating this "on-site  
706 presence" such as video monitoring and chat, instant messaging, computer activity  
707 monitoring systems, or video conference calling.

708 Expectations regarding the performance of work SHOULD be the same for on-site  
709 employees as well as virtual workers.

710 Virtual positions SHOULD be assigned based on established skill sets, met expectations,  
711 and performance. It is recommended the performance of employees selected to work  
712 remotely be reviewed on an established timeline to determine if the employee continues to  
713 be suited well for a remote position or SHOULD revert back to the on-site environment.

714 Supervisors SHOULD meet one-on-one with employees on a regular basis on-site or using a  
715 video conference. Employees and supervisors alike SHOULD conduct these meetings in a  
716 private setting to provide both privacy and a place free from distraction. During this time,  
717 the supervisor can assess how the employee is doing overall as well as recognize conflict or  
718 interpersonal communication issues amongst the team and field responders.

719 All employees SHOULD be acknowledged for their accomplishments. Managers SHOULD be  
720 creative in the ways they recognize and reward remote employees and seek out  
721 opportunities to provide in-person recognition when possible.

722 **15.1 Employee Appraisal and Review**

723 In a traditional PSAP, managers or supervisors typically use organization-approved systems  
724 of performance evaluations to provide feedback on performance, determine pay rates, and  
725 encourage employees to perform their best. PSAP management SHOULD develop  
726 automated, data-driven performance systems that enable supervisors to objectively

727 measure and reward performance in real time whereby all employees will be evaluated  
728 based on established performance standards.

729 Ideally, incentive systems SHOULD put workers in the driver's seat by proactively providing  
730 them with real-time information about their performance compared to the organization's  
731 standards. Employees SHOULD be able to see their scores on individual metrics so they can  
732 see exactly where they have to improve. Metrics MAY include call answer times, call  
733 duration averages, triage times, QA/QI scores, and more. Systems SHOULD also provide  
734 links to e-learning materials so that employees can proactively take action to improve areas  
735 of weakness identified through such scores outside of a performance evaluation. These  
736 scores SHOULD be updated frequently so that employees can see how improvements in  
737 their performance quickly translate into improvements in their scores.

738 Performance evaluations and appraisals SHOULD measure a telecommunicator's  
739 performance against key performance indicators. These indicators SHOULD be the same  
740 whether the employee is physically located in the PSAP or is at a remote location operating  
741 in a Virtual PSAP capacity.

742 PSAP managers will need to assess the management tools available to their supervisors to  
743 adequately evaluate a telecommunicator's performance. These tools MAY include the  
744 following:

- 745 • Reviewing recorded audio of an incident
- 746 • Real-time monitoring to include audio, screen capture/recording, and entry of an  
747 incident into the CAD system
- 748 • Protocol quality assurance/quality improvement programs
- 749 • Analytics that provide statistical performance data (i.e., average handling time,  
750 postprocessing time)

751 Virtual PSAP managers MAY need to be creative and employ new methods and/or  
752 applications that assist in remote monitoring of a virtual worker to ensure that policies and  
753 procedures as well as quality of service in the virtual environment is at an equal level to the  
754 service and professionalism provided in the on-site PSAP.

755 During the agency's evaluation period, virtual telecommunicators SHOULD be appraised  
756 utilizing the performance review process that on-site employees receive. At a minimum, the  
757 virtual worker SHOULD be allotted personal time with their supervisor to discuss progress  
758 and recommendations for improvement. Additionally, the virtual worker SHOULD be given  
759 the opportunity to provide feedback to the supervisor to help identify any special needs or  
760 training that can be necessary to accommodate the virtual worker in performing his/her job  
761 tasks.

## 762 **16 Mental Health, Wellness, and Peer Support**

763 In alignment with existing NENA standards, PSAPs SHOULD establish a Comprehensive  
764 Stress Resilience Plan (CSRP). This plan will need to be adapted to accommodate the  
765 virtual PSAP environment when supporting off-site and remote employees. For additional  
766 information about creating a CSRP at a PSAP, please reference the NENA Standard to  
767 Protect the Wellbeing of 9-1-1 Professionals, NENA-STA-002 [3], and the NENA Peer  
768 Support Team Development, Implementation, and Oversight information document,  
769 NENA-INF-044 [4].

770 Virtual PSAP leaders MUST create a strategic plan that supports the mental health and  
771 wellness of their staff and is adapted to accommodate the virtual environment the PSAP  
772 operates under. Leaders SHOULD look at how they could implement these plans and  
773 programs with remote personnel. For example:

- 774 • How will remote employees access this support in an effective way?
- 775 • How will the need for support be identified?
- 776 • How will effective, comprehensive, and ongoing training be provided on this  
777 important topic considering what is appropriate to do remotely vs. in person?
- 778 • How will a peer support program be managed with remote workers?
- 779 • Does the Employee Assistance Program (EAP) provided have a network of clinicians  
780 in all the areas remote employees reside?
- 781 • How will remote employees participate in Critical Incident Stress Management  
782 (CISM) debriefs?
- 783 • How will PSAP Management monitor remote employees with regard to a CSRP?

784 There are many options for providing a Comprehensive Stress Resilience Plan (CSRP) that  
785 adapts to the type of virtual PSAP. Some solutions include, but are not limited to, the  
786 following:

- 787 • Provide in-person training and support.
- 788 • Provide 24/7 access to an EAP which allows employees to work within their  
789 schedules and local resources.
- 790 • Provide a list of therapists specializing in the treatment of stress and traumatic  
791 stress disorders and who utilize evidence-based therapies in the treatment of Post-  
792 Traumatic Stress Disorder (PTSD) that is local to each employee.
- 793 • Provide personnel education and access to on-site and online information about  
794 stress-related risks.
- 795 • Provide access to a workout facility and nutritional programs to adopt a healthy  
796 lifestyle while working remotely.
- 797 • Implement a quick mental health check-in during roll call before a shift starts.
- 798 • Encourage a routine to mentally prepare for the start and end of each shift.
  - 799 ○ Create a workspace feeling by adjusting lighting and organizing the at-home  
800 "workstation."

- 801 ○ Set aside time to think about the upcoming shift and reflect on the end of a
- 802 shift. Consider the way on-site employees do this during their commute in
- 803 and out of the workplace.
- 804 ● Facilitate some type of team building or staff meetings to ensure a sense of team
- 805 environment.
- 806 ● Enforce a break schedule that allows the remote employee to “unplug” from their
- 807 job duties as if they were leaving the dispatch floor to visit a break room or go out
- 808 to get lunch.
- 809 ● Ensure remote employees are able to participate, either in-person or virtually, in
- 810 CISM debrief.
- 811 ● Provide remote employees with access to Peer Support resources, either in-person
- 812 or virtually.

813 Mental health and wellness issues are likely to be different for every remote employee  
814 depending on their schedule, position, and location relative to the actual PSAP. A remote  
815 telecommunicator, for example, could miss the teamwork aspect of the job or could work  
816 odd hours and not have easy access to mental health resources. PSAP Managers SHOULD  
817 identify the pros and cons for each position working remotely and adjust as necessary.

## 818 **17 Continuity of Operations Planning**

819 An agency’s Continuity of Operations Plan (COOP) MAY include a virtual PSAP element due  
820 to a need to relocate from the main facility. Remote operations MAY provide the support  
821 needed during the relocation from a primary site to an alternate location without relying on  
822 outside agencies. A strong operational plan removes single points of failure.

823 When approving alternate sites, including staff residences, selection criteria SHOULD mirror  
824 those used for traditional PSAPs.

825 A COO for virtual operations SHOULD include considerations such as these:

- 826 ● Access to FirstNet and additional wireless networks including access to Government
- 827 Emergency Communications Service (GETS) and Wireless Priority Service (WPS)
- 828 ● Reliable utilities and adequate UPS devices for all needed equipment
- 829 ● Multiple paths for Session Initiation Protocol (SIP) packets to be delivered to call-
- 830 taking positions with the ability to return interrupted calls to the queue. A “make-
- 831 busy” circuit for legacy equipment to route callers to another network might be
- 832 needed.
- 833 ● An alternate call processing system due to the loss of CAD or call processing
- 834 protocol software
- 835 ● Alternate access to radio networks for virtual dispatching
- 836 ● A plan for supplementing virtual staff when those operations are diminished or cease
- 837 due to loss of connectivity to operational networks
- 838 ● An evacuation and/or rescue plan for remote staff when possible

- 839 • A relocation plan for virtual staff to an established alternate site for significant
- 840 system failures with a predetermined timeframe
- 841 • A process for returning to normal operations when the event has been stabilized and
- 842 it is safe to do so
- 843 • A process to document events including timestamps if alternate documentation was
- 844 utilized

## 845 **18 Supervisory Management**

846 Managing remote telecommunicators MAY require some additional or even different skill  
847 sets from those needed to be successful in an on-site PSAP environment. Even though the  
848 ability to successfully communicate with staff is critical for any manager, there are  
849 additional challenges for those who MUST manage staff that they might not know on a  
850 personal basis and/or are in multiple remote locations. Some specific management roles  
851 MAY include the following responsibilities:

- 852 • Develop selection processes that will project the success of a remote applicant.
- 853 • Develop real-time quality control processes that include surveying the users of the
- 854 system (in-person and remote), remote monitoring, instant messaging, or other
- 855 means of communicating.
- 856 • Develop and implement an effective training and awareness program that
- 857 emphasizes the critical services provided.
- 858 • Develop official virtual work agreements to provide clear expectations and guidelines
- 859 to PSAP employees working remotely.
- 860 • Develop performance assessments, including self-evaluations, to adapt to the needs
- 861 of a virtual PSAP work structure and incorporate elements related to working
- 862 virtually as well as general performance.
- 863 • Schedule remote personnel both for a normal shift and those needed during an
- 864 emergency.
- 865 • Oversee the operation from the macro level and delegate and empower key staff
- 866 members to carry out the quality control program.
- 867 • Oversee compliance with cyber security procedures.
- 868 • Monitor mental health by having an awareness of key indicators showing employees
- 869 who could need assistance.
- 870 • Develop a program for wellness (e.g., use of wearable devices to manage stress,
- 871 easy access to wellness services such as peer support, and use of a post critical
- 872 incident debriefing model, including monitoring to identify incidents requiring
- 873 additional follow-up).
- 874 • Coach or discipline employees as needed. It is recommended that any disciplinary
- 875 processes follow the same procedure as the on-site PSAP.

876 There is no doubt that the next-generation system will provide the flexibility to allow  
877 multiple staffing models both on-site and remote. It is incumbent that public safety

878 organizations at the highest level consider the staffing problems that currently exist and  
879 evaluate the potential of a culture shift toward utilizing remote emergency communication  
880 personnel.

881 Managers of virtual teams (individuals or groups of individuals at remote sites) will have to  
882 learn how to support a virtual team, which includes:

- 883 • Recognizing them and their importance
- 884 • Encouraging members to explore questions about how they are working together as  
885 a team
- 886 • Supporting the creation of some kind of shared space (the feeling that there is an  
887 infrastructure where people are working together)
- 888 • Facilitating the coordination of the technology, work processes, and the formal  
889 organization
- 890 • Recognizing that remote employees can need additional time to mentally process  
891 strenuous calls and be available for additional support if needed
- 892 • Supporting activities that make the informal network visible

## 893 **19 Management Skills**

894 PSAP administrators SHOULD provide recommendations and seek support and guidance  
895 from any applicable governing 9-1-1 Authorities. These individuals are expected to ensure  
896 their facilities, staff, and resources meet the requirements and expectations necessary for  
897 implementing and managing a virtual PSAP.

898 Many of the position requirements for the director level of the virtual PSAP will remain the  
899 same as those required to lead an on-site, traditional PSAP. The director will be responsible  
900 for performing complex contract development and administration work, along with the  
901 responsibility for the coordination and implementation of service agreements across the  
902 communication network. They will also be required to provide vision, solid leadership,  
903 coaching, direction, and resources to build a team capable of providing efficient and  
904 effective service to the public and field responders the organization serves.

905 Some of the specific position requirements for top-level management of a virtual PSAP that  
906 could present unique challenges from the traditional PSAP may include the following:

- 907 • The knowledge and ability to ensure that the management operating a virtual PSAP  
908 or hybrid PSAP is in compliance with Federal, State, and Local regulations, statutes,  
909 and ordinances (Some of these can vary from the traditional PSAP due to security,  
910 privacy, and confidential issues.)
- 911 • The knowledge and ability to understand the underlying network and technology  
912 available and ensure that systems are in place that will monitor both technology and  
913 personnel on the system along with providing real-time alerts and metrics

- 914 • The ability to establish and implement a Continuity of Operations (COOP) plan that  
915 incorporates virtual PSAP technology and staffing needs to ensure that essential  
916 functions continue to be performed during a disruption of normal operations
- 917 • The ability to manage contract services if staffing for a virtual PSAP expands to  
918 include independent contractors serving as Telecommunicators
- 919 • The ability to lead, guide, and direct the strategic planning, operation, and  
920 integration administratively throughout the system by identifying effective strategies  
921 regarding issues that affect the success of the virtual organization
- 922 • The ability to utilize industry subject matter experts and adapt to dynamic changes  
923 in the business model
- 924 • The ability to facilitate face-to-face communication in a virtual environment to help  
925 create a sense of connection with co-workers and the overall mission of the  
926 organization, such as video conference or in-person team meetings

927 In addition to these specific position requirements for consideration, there are several  
928 essential competencies that an effective top-level manager could need to possess to better  
929 perform in the new environment. PSAP managers today need to maintain high standards of  
930 personal integrity in order to transmit those same expectations to all employees of the  
931 organization. The expectations for the staff who will be working virtually will require a high  
932 degree of credibility and consistency on the part of all staff including supervision and  
933 upper-level management, which will set the tone and establish the culture for the  
934 organization.

935 The manager of a virtual PSAP with both on-site workers and virtual workers will need to  
936 be a manager who is comfortable with new challenges and learning opportunities. The  
937 successful virtual PSAP manager will likely gain insight from experiences and will be  
938 personally committed to self-improvement and the continual improvement of the operation  
939 they manage.

940 As with any top-level management position, effective communication is critical. A  
941 successful manager will facilitate the free flow of information and communication  
942 throughout the organization and encourage open expression of ideas and opinions. The  
943 manager's position will require the ability to communicate frequently and inspire others to  
944 contribute ideas on their own.

945 Other essential competencies that would be beneficial for both traditional and virtual PSAP  
946 managers include the following:

- 947 • Results oriented and drives execution
- 948 • Passion for service
- 949 • Builds organizational relationships
- 950 • Leads/Manages change and innovation
- 951 • Develops and inspires people
- 952 • Vision/Strategy/Judgment

- 953 • Influences others and manages differences
- 954 • Resource management
- 955 • Leverages technology
- 956 • Embraces diversity

## 957 **20 Conclusion**

958 This informative document offers recommendations on handling the numerous duties  
959 necessary for effective operations in the virtual PSAP environment and considerations for  
960 mitigating service impacts.

961 Every PSAP MUST determine if and when a virtual PSAP concept suits their environment or  
962 circumstance. The actual work within the structure of the PSAP could remain the same;  
963 however, the means to provide the service to the public will change and evolve as new  
964 technology emerges.

965 Not all PSAP managers may seek virtual work within the 9-1-1 architecture, nor COULD it  
966 be feasible in all settings. PSAP managers can have a chance to improve their operations  
967 due to the changes in the workforce that we are seeing today. Change is constant within  
968 the PSAP environment, and as the nation moves into a Next Generation 9-1-1 structure, a  
969 virtual work environment could become more common.

970 Telecommunicators MAY be tasked to perform additional duties within the NG9-1-1  
971 environment. The movement into a virtual PSAP will bring a higher level of skilled  
972 personnel with a multitude of skills ranging from decision-making to the ability to problem-  
973 solve within a self-supervised environment.

974 As PSAPs contemplate a virtual work environment, this document contains topics of  
975 consideration from physical and network security to the staff selection process, training  
976 objectives, teamwork, managerial processes, policymakers, telecommunicator performance,  
977 continuity of operations, and technology.

## 978 **21 Impacts and Considerations**

### 979 **21.1 Operations Impacts Summary**

980 The operational impact of implementing a virtual work environment SHOULD ultimately  
981 make PSAPs more efficient and as such be a value to public safety. This document SHOULD  
982 serve as a transitional resource for initiating a virtual option and letting it develop into an  
983 everyday part of daily operations. Ultimately, the development of virtual public safety  
984 communications will have multiple benefits in addition to call processing efficiency, such as  
985 expanding the potential workforce, retaining seasoned staff, and offering a quickly scalable  
986 staffing model.

987 **21.2 Technical Impacts Summary**

988 The technical impacts will vary based on the equipment currently used and the scope of  
989 the virtual environment being added. As the implementation of virtual operations increases  
990 vendors will begin to expand solutions for the common technological roadblocks  
991 experienced.

992 **21.3 Security Impacts Summary**

993 Security threats whether within a traditional PSAP or with remote work will continue to be  
994 an evolving threat. Due diligence on the part of security SHOULD involve rigorous testing  
995 and training on physical, network, and cybersecurity. Security concerns need not be a  
996 deterrent to the expansion into the virtual environment.

997 **21.4 Recommendation for Additional Development Work**

998 It is well established within this standard that virtual PSAP environments will be an  
999 evolutionary process and not a "one size fits all process." While this standard establishes a  
1000 process for this evolution, a working committee SHOULD be established to share results  
1001 with others as implementation matures. Within this committee, work groups SHOULD be  
1002 based on PSAP size with work groups dedicated to the security process and another for  
1003 state-level administrators to discuss the impact of the NG9-1-1 network of networks  
1004 including the inter-PSAP data exchanges that will rapidly develop and how remote and  
1005 alternate PSAP models interact with this data flow.

1006 **21.5 Anticipated Timeline**

1007 Currently, most higher-tier CAD systems SHOULD offer a Virtual Private Network (VPN)  
1008 option. Moreover, both legacy and NG networks SHOULD allow for VPN access to local  
1009 emergency networks. This VPN access makes some level of virtual operations quickly  
1010 implementable. P25 radio systems offer both laptop radio consoles and applications to  
1011 access radio networks that are cost-effective, scalable, and easy to implement. The cost  
1012 savings made by implementing regional partnerships SHOULD be explored. It is believed  
1013 that virtual environments are possible today and SHOULD continue to evolve as new  
1014 technology and security measures develop.

1015 **21.6 Cost Factors**

1016 Initial costs for setting up a virtual environment could add to the PSAP budget. However,  
1017 over time, the PSAP could see cost savings when implementing a virtual environment over  
1018 traditional PSAP expansion.

1019 **22 Abbreviations, Terms, and Definitions**

1020 See the NENA Knowledge Base (NENAKb) [1] for a Glossary of terms and abbreviations  
 1021 used in NENA documents. Abbreviations and terms used in this document are listed below  
 1022 with their definitions.

<b>Term or Abbreviation (Expansion)</b>	<b>Definition / Description</b>
ADA (Americans with Disabilities Act)	Federal Legislation passed into law July 26, 1990, that prohibits discrimination on the basis of disabilities. This landmark civil rights law both identifies and prohibits discrimination on the basis of disability in employment, state and local government, public accommodations, commercial facilities, transportation, and telecommunications. This Act requires all Public Safety Answering Points (PSAPs) to provide direct and equal access to emergency telephone services for people with disabilities who use teletypewriters (TTY/TDDs), which are also known as telecommunications devices for the deaf. This means that the personnel answering calls at the PSAP level must be able to directly receive TTY/TDD calls and must be able to engage in TTY/TDD conversation.
CAD (Computer Aided Dispatch)	A computer-based system which aids PSAP Telecommunicators by automating selected dispatching and record keeping activities.
CISM (Critical Incident Stress Management)	A team comprised of peers and mental health professionals who train and work together to help personnel through traumatic and/or critical incidents. These teams play a crucial role following a critical incident by providing group defusing and debriefing meetings and coordinated conversations to mitigate stress reactions and provide guidance on coping. CISM Teams may be local, regional, or from different parts of the US, as it is strongly discouraged for peers to debrief their own personnel.
CJIS (Criminal Justice Information Services)	The focal point and central repository for criminal justice information services in the FBI. Programs initially consolidated under the CJIS Division included the NCIC (National Crime Information Center), UCR (Uniform Crime Reporting), and Fingerprint Identification. In addition, responsibility for several ongoing technological initiatives was transferred to the CJIS Division, including the IAFIA (Integrated Automated Fingerprint Identification System), NCIC 2000, and the NIBRS (National Incident-Based Reporting System).

<b>Term or Abbreviation (Expansion)</b>	<b>Definition / Description</b>
COOP (Continuity of Operations Plan)	A plan to ensure that Primary Mission Essential Functions continue to be performed during a wide range of emergencies, including localized acts of nature, accidents, and technological or attack-related emergencies.
CSRP (Comprehensive Stress Resilience Plan)	A plan developed by PSAP leaders in accordance with expert guidance and resources provided by NENA addressing stress and all major factors impacting the well-being and performance of 9-1-1 Professionals to optimize their resilience and well-being. (NENA-STA-002.2-2022)
EAP (Employee Assistance Program)	An employee benefit program that assists employees with personal problems and/or work-related problems that may impact their job performance, health, mental and emotional well-being.
ESInet (Emergency Services IP Network)	A managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core services can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services. ESInets may be constructed from a mix of dedicated and shared facilities. ESInets may be interconnected at local, regional, state, federal, national, and international levels to form an IP-based internetwork (network of networks). The term ESInet designates the network, not the services that ride on the network. See NGCS (Next Generation 9-1-1 Core Services).
GETS (Government Emergency Telecommunications Service)	Supports national leadership; federal, state, local, tribal, and territorial governments; first responders; and other authorized national security and emergency preparedness (NS/EP) users. It is intended to be used in an emergency or crisis situation when the landline network is congested and the probability of completing a normal call is reduced.
GIS (Geographic Information System)	A system for capturing, storing, displaying, analyzing, and managing data and associated attributes which are spatially referenced.

<b>Term or Abbreviation (Expansion)</b>	<b>Definition / Description</b>
HIPAA (Health Insurance Portability and Accountability Act)	A federal law that amended the Internal Revenue Code of 1986 to improve portability and continuity of health insurance coverage in group and individual markets, to combat waste, fraud, and abuse in health insurance and health care delivery, to promote the use of medical savings accounts, to improve access to long-term care services and coverage, to simplify the administration of health insurance, and for other purposes.
MOU (Memorandum of Understanding)	A document written between parties to cooperatively work together on an agreed-upon project or meet an agreed-upon objective.
NG9-1-1 (Next Generation 9-1-1)	<p>An IP-based system comprised of hardware, software, data, and operational policies and procedures that:</p> <ul style="list-style-type: none"> <li>(A) provides standardized interfaces from emergency call and message services to support emergency communications;</li> <li>(B) processes all types of emergency calls, including voice, data, and multimedia information;</li> <li>(C) acquires and integrates additional emergency call data useful to call routing and handling;</li> <li>(D) delivers the emergency calls, messages, and data to the appropriate public safety answering point and other appropriate emergency entities;</li> <li>(E) supports data or video communications needs for coordinated incident response and management.</li> </ul>
PSAP (Public Safety Answering Point)	A physical or virtual entity where 9-1-1 calls are delivered by the 9-1-1 Service Provider.

<b>Term or Abbreviation (Expansion)</b>	<b>Definition / Description</b>
PTSD (Post-Traumatic Stress Disorder)	<p>An official clinical diagnosis of the American Psychiatric Association widely used by mental health professionals to describe and treat the condition of a person who meets the following criteria:</p> <ul style="list-style-type: none"> <li>• Has been exposed to a traumatic event (see definition of Traumatic Event)</li> <li>• Experiences several symptoms enduring for at least 1 month after the traumatic event(s) from each of three symptom clusters:               <ul style="list-style-type: none"> <li>o Intrusive recollections</li> <li>o Avoidance/numbing symptoms</li> <li>o Hyper-arousal symptoms</li> </ul> </li> </ul> <p>The above symptoms occur for more than one month following exposure to the event. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.</p>
QA/QI (Quality Assurance/Quality Improvement)	<p>All actions taken to ensure that standards and procedures are adhered to and that delivered products or services meet performance requirements. An organized system that assesses and evaluates the process to improve the quality of services provided.</p>
SIP (Session Initiation Protocol)	<p>A protocol specified by the IETF (RFC 3261) that defines a method for establishing multimedia sessions over the Internet. Used as the call signaling protocol in VoIP, NENA i2, and NENA i3.</p>
SOP (Standard Operating Procedure)	<p>A written directive that provides a guideline for carrying out an activity. The guideline may be made mandatory by including terms such as "shall" rather than "should" or "must" rather than "may."</p>

Term or Abbreviation (Expansion)	Definition / Description
Virtual PSAP	An operational model directly enabled through NG9-1-1 features and/or network hosted PSAP equipment in which telecommunicators are geographically dispersed, rather than working from the same physical location. Remote access to the PSAP applications by the dispersed telecommunicators requires the appropriate network connections, security, and work station equipment at the remote location. The virtual work place may be a logical combination of physical PSAPs, or an alternate work environment such as a satellite facility, or any combination of the above. Workers are connected and interoperate via IP connectivity.
VPN (Virtual Private Network)	A network implemented on top of another network, and private from it, providing transparent services between networks or devices and networks. VPNs often use some form of cryptographic security to provide this separation.
WPS (Wireless Priority Service)	A Federal program that authorizes cellular communications service providers to prioritize calls over wireless networks.

1023

1024 **23 References**

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