AWARD NUMBER: 001-MOD3   Task order [W81XWH1590001-0006]

TITLE: Prototype of Joint Evacuation and Transport Simulation (JETS) System

PRINCIPAL INVESTIGATOR: Catherine Strayhorn, CEO, IVIR Inc.

PERFORMING ORGANIZATION: Information Visualization and Innovative Research (IVIR Inc.)

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PREPARED FOR: U.S. Army Medical Research and Development Command
                             Fort Detrick, Maryland 21702-5012

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6. AUTHOR(S) Strayhorn, Catherine, BS-PI; Lewandowski, William, MS-Educational Engineer; Kuenzig, Dee, MS-Program Manager; Honold, Erin, BS-Systems Engineer; Lewandowski, William II, MS-Architecture Engineer Researcher: Shuford, Charles, BS -Sr. Researcher E-Mail:cstrayhorn@ivirinc.com		**5d. PROJECT NUMBER** MT17007.03
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Information Visualization and Innovative Research (IVIR Inc.) 1990 Main Street, Suite 750 Sarasota, Fl. 34236		**8. PERFORMING ORGANIZATION REPORT** _____
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13. SUPPLEMENTARY NOTES
Prepared in cooperation with sub-awardees Vcom3D, Discovery Machine, Pitch Technologies, Education Management Solutions (EMS) and program Subject Matter Experts (SMEs)

14. ABSTRACT
Proper medical training is critical to ensure that Service component members are prepared for wartime deployment, with a particular emphasis to support the en route care of patients from initial point of injury through several echelons to Continental U.S. (CONUS)-based military hospitals. Currently, medical training is generally conducted within each Service component "independently" (i.e., Army, Navy, Air Force, etc.) and our NATO/Coalition allies, with only occasional combined training. In addition, there is a wide repertoire of tools, devices, and approaches used to provide deployable training to Service members, ranging from devices (e.g., manikins) to computerized simulations to formal didactic training through internet-based, video, or classroom style instruction. This study and design effort systematically gathered and transformed requirements for JETS into an architecture description that provides a basis for understanding the current state of the potential component parts, the work required to achieve the Medical Simulation Enterprise (MSE) vision, and the staging of further development to successfully bring the full family of systems online.

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15. SUBJECT TERMS					
Medical simulation, casualty care, high level architecture, federation object model, capability development document, training					

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (include area code)
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<u>Annual Technical Status Report for</u>
MTEC -17-07-JETS-03 Prototype of Joint Evacuation and Transport Simulation (JETS) System
Research Project No. 2018-649-001
EGS# MT17007.03
Reporting Period: Effective Date – 01 January 2019 through 31 December 2019

MTEC Research Project Awardee
Catherine Strayhorn, CEO, Contractual Representative
IVIR Inc.
1990 Main Street, Suite 750
Sarasota, Fl. 34236
941-961-0627
cstrayhorn@ivirinc.com

Research Project Technical POC
William Lewandowski
IVIR Inc.
1990 Main Street, Suite 750
Sarasota, Fl. 34236
blewandowski@ivirinc.com

Submitted: Original Report Date: January 24, 2020
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1. Project Status
a. Accomplishments
This may include completion of milestones, objectives, and/or tasks, regulatory approval received, publication of papers, presentations at conferences, filing of intellectual property, etc. for this quarter, followed by date in DD-MMM-YYYY. Write salient bullet points to highlight the requested information.

The following objectives and tasks were accomplished during the reporting period of 01-January-2019 through 31-March-2019:

PHASE II
- Updated Project Plan in MS Project Plan Monthly
- Continued weekly Scrum meetings on Wednesday and Friday
- Continued weekly Program and monthly Sprint meetings, submitted minutes with monthly reports
- Repositories in both Zoho and LT2 are maintained and up to date
- Held monthly agile review on 14 January 2019, minutes were taken and submitted
- Submitted Quarterly Report on 25 January 2019 (Milestone 29)
- Submitted Annual Report on 25 January 2019 (Milestone 30)
- Held monthly agile review on 04 February 2019, minutes were taken and submitted
- Held Critical Design Review (CDR) on 08 February 2019 in Orlando, FL – Minutes were taken and submitted with MS32 Monthly Report
- Held In-Progress Review (IPR) on 12 February 2019 in Orlando, FL
- Held monthly agile review on 04 March 2019, minutes were taken and submitted
- Scheduled monthly agile review for 01 April 2019, minutes are included with the next monthly report

The following objectives and tasks were accomplished during the reporting period of 01-April-2019 through 30-June-2019:

PHASE II
- Updated Phase II Project Plan in MS Project and provided updates monthly
- Continued SCRUM meetings, held twice per week on Wednesday and Friday
  - o SCRUM meetings transitioned to once per week on Wednesdays during June
  - o Discontinued SCRUM meetings during the last week of June through the end of the program
- Conducted weekly program meetings, minutes were provided as appendices to monthly reports
- Held monthly agile review on 01 April 2019, minutes were provided
- Submitted the Quarterly Report on 25 April 2019
- Scheduled and held monthly agile review on 06 May 2019, minutes were provided
- Scheduled and held deliverable outline review on 29 May 2019
- Attended ITEC Conference in Stockholm, Sweden on 14-16 May 2019
  - o A trip report was prepared and submitted with MS 38
    File Name: *ITEC Trip Report 13-17 May.pdf*
- Held monthly agile review on 03 June 2019, minutes are included in Appendix C
- Demonstration of the Preliminary FOM was accomplished
- Scheduled monthly agile review for 01 July 2019, minutes will be included with the final report

The following objectives and tasks were accomplished during the reporting period of 01—July-2019 through 30-Sept-2019:

PHASE II
- Updated Project Plan in MS Project Plan Monthly
- Held monthly Status Meeting 01 July 2019, minutes were taken and submitted

- Continued coordination meetings as requested by Government with SimQuest to manage the deadlines and deliverables for Phase II
- Repositories both in Zoho and LT2 are maintained and up to date
- Submitted Phase II Final Report 22 July 2019
- Received feedback from Government 09 Sept 2019
- Submitted response to question regarding Appendix G 12 September 2019

PHASE III
- Created internal repository in Zoho
- Requested LT2 poral for Phase III
- Held Internal Phase III Kick-off meeting 1-2 August 2019
- Weekly JETS Phase III Status meetings commenced 12 August 2019 and continue. Minutes were taken and submitted in monthly reports
- Held Government Kick Off Meeting 21 August 2019 during MHSRS
- Phase III Monthly meeting held 03 September 2019. Minutes were taken and submitted
- Scheduled next monthly meeting for 07 October 2019
- Monthly Status Brief meeting was scheduled for 07 October 2019
- Received letter of approval to use the bridge SW created in Phase II for use in the Phase III effort. Letter for approval dated 09 September 2019
- Submitted Quality Control Plan on (06 September 2019)
- Submitted draft of Project Plan on (06 September 2019)

The following objectives and tasks were accomplished during the reporting period of 01-October-2019 through 31-December-2019:

PHASE III
- Weekly JETS Phase III Status meetings commenced 12 August 2019 and continue. Minutes are taken and submitted in monthly reports
- JETS Architecture – Phase III Monthly meeting held 07 October 2019,
  - Minutes were taken and submitted
- Monthly Status Brief meeting was held 07 October 2019
- JETS Architecture – Phase III Monthly meeting held 0 November 2019,
  - Minutes were taken and submitted
- Monthly Status Brief meeting was held 0 November 2019
- JETS Architecture – Phase III Monthly meeting held 0 December 2019
  - Minutes were taken and submitted
- Monthly Status Brief meeting was held 0 December 2019
- Submitted Quality Control Plan on (06 September 2019)
- Submitted draft of Project Plan on (06 September 2019)

b. Reportable Outcomes

This may include development of a product, prototype, new methodology, or any other similar items that have resulted from this research. Write salient bullet points to highlight the requested information. Please also include a cumulative chronological list of written publications in technical journals, papers, or other presentations at meetings, conferences, seminars, etc.; New discoveries, inventions, or patent disclosures, and specific applications.

The following outcomes were realized during the reporting period of 01-January-2019 through 31-March-2019:
- Repositories in both Zoho and LT2 were maintained and up to date
- Updated the Phase I deliverables per feedback, and provided all updated versions on 15 February 2019
- Submitted final Phase I deliverables on 25 February 2019

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The following outcomes were realized during the reporting period of 01—April-2019 through 30-June-2019:
- Repositories in both Zoho and LT2 were maintained and up to date

The following outcomes were realized during the reporting period of 01-July-2019 through 30-Sept-2019:

PHASE II
- Repositories in both Zoho and LT2 were maintained and up to date through end of Phase II.
- Submitted final Phase II deliverables on 22 July 2019
- Updated the Phase II deliverables per feedback received and submitted Annex G -Updated on 12 September 2019.
- Waiting for feedback from Government on updated Annex G

PHASE III
- Quality Control Plan (MS 52) approved with explanation 30 September 2019

The following outcomes were realized during the reporting period of 01-October-2019 through 31-December-2019:
- Repositories in Zoho maintained and up to date

c. **Progress Detail**

Describe each Statement of Work (SOW) task or logical segment of work on which effort was expended during this quarterly reporting period only. Description shall include pertinent data and graphs in sufficient detail to explain any significant results achieved or problems encountered. A succinct description of the methodology used shall be provided.

For an award that includes the recruitment of human subjects for clinical research or a clinical trial: (i) report progress on subject recruitment, screening, enrollment, completion, and numbers of each compared to original planned target(s), e.g., number of subjects enrolled versus total number proposed; (ii) report amendments submitted to the IRB and USAMRMC HRPO for review; and (iii) any adverse events.

Milestone Progress Detail for the reporting period of 01-January-2019 through 31 March-2019:

PHASE II: POINTS
- 022: Conduct Front-end Domain Analysis POINTS – **In Progress**
  - Continued conducting literature review, analyzed curriculums, and updated LVCG technologies:
    - Continued work on the annotated bibliography
    - Updated the LVCG technology matrix, the document on military doctrine, and the document on healthcare providers
    - Created and updated the LVCG summary report for POINTS
    - Compiled research from SimQuest into the research documents
  - The following files were submitted with MS31:
    - File Name: *LVCG OVERALL MATRIX Draft 03-01-2019.xlsx*
    - File Name: *HEALTHCARE PROVIDERS 02.19.2019.pdf*
    - File Name: *MILITARY MEDICAL DOCTRINE 02.19.2019.pdf*
  - The following files were submitted with MS32:
    - File Name: *HEALTHCARE PROVIDERS 03.27.2019.pdf*
    - File Name: *POINTS LVCG SIMULATION SUMMARY 03.27.2019.pdf*
    - File Name: *POINTS LVCG MATRIX 03.27.2019.xlsx*
      - **The Government has already conducted an initial review of these files and provided feedback on 22 March 2019.**
  - Conducted interviews with relevant military medical personnel:

- Sent out (seven) 7 introductions and requests for interviews from recommendations given during the IPR.
- Scheduled and conducted interviews with the following:
  - HM1 Michael Chernenko, CNO HELSEACOMBATRON, San Diego, CA: Chief of Naval Operations Office Search and Rescue Office
  - HM2 Nicholes Davis, CNO, Flight Medic Course, Naval Aerospace Medical Institute (NAMI), Pensacola, FL
- The following file was submitted with MS32 Report:
  - File Name: *NAVY SUPPLEMENTAL INTERVIEWS.pdf*

- 026: Develop POINTS Architecture Data Plan and Requirements Definition: – **In Progress**
  - Continued gathering data from POINTS Draft CDD to identify architecture design requirements.
  - Began researching information on tactical and command/control simulations that utilize HLA and other standard architectures. File name: *HLA Tactical Simulations List.docx and HLA Tactical Simulations List.pdf* were submitted with MS28 Monthly Report.
  - Continued researching information on tactical and command/control simulations that utilize HLA and other standard architectures:
    - The research is to identify possible non-medical architectures that may need to be accounted for in the POINTS/JETS design
    - Met with Cole Engineering on 07 February 2019:
      - Discussed potential interoperability with the OneSAF architecture in the future.
      - Received request to share information with the Navy/NAWCTSD on the Total Learning Architecture project
        - Request submitted to Dr. Frye on 13 February 2019
- 027: Sprint Monthly Planning Report, Phase II Month 5 – Due 07 January 2019 - **Completed – Submitted 07 January 2019:**
  - Held weekly program meetings
  - Held Monthly Sprint Review Meeting
- 028: Sprint Monthly Planning Report, Phase II Month 6 – Due 07Feb2019 – **Completed – Submitted 06 February 2019:**
  - Held weekly program meetings
  - Held Monthly Sprint Review Meeting
- 029: Quarterly Report Number 4 – Due 25 January 2019- **Completed – Submitted 25 January 2019**
- 030: Annual Report Number 1 – Due 25 January 2019 - **Completed – Submitted 25 January 2019**
- 031: Sprint Monthly Planning Report, Phase II Month 7 – Due 07 March 2019 – **Completed – Submitted 07Mar2019**
  - Held weekly program meetings
  - Held Monthly Sprint Review Meeting
- 032: Sprint Monthly Planning Report, Phase II Month 8 – Due 05 April 2019 - **In Progress**
- 033: Develop POINTS Capability Models: – **In Progress**
  - Reviewed the draft CDD to identify capabilities
  - Began and Continued developing capability models for POINTS
- 034: Conduct Feasibility Study POINTS: – **In Progress**
  - Began and continued initial plans for feasibility studies for the POINTS architecture
- 035: Develop POINTS Operational System Models: – **In Progress**
  - Reviewed the draft CDD to identify capabilities and related operations
  - Continued developing operational system models for POINTS
- 039: Conduct Site Visits and Critical Design Review POINTS – **In Progress**
  - Attended the Military Operational Medicine Symposium in San Diego, CA on 23-24 January 2019

- Prepared a trip report summarizing the conference. File Name: *Operational Medicine 2019 IVIR Trip Report.pdf* was placed on the LT2 portal: POINTS portal, Files section, Site Visits folder and noted in MS28 monthly report
  - ○ Held CDR on 08 February 2019 in Orlando, FL:
    - Meeting was attended by members from JPC-1, IVIR and SimQuest
    - Reviewed the status of the front-end research, discussed tying tactical architecture into JETS/POINTS, reviewed the DoDAF designs, reviewed the FOM development and demonstration, and discussed future risks and mitigations:
      - File Name: *CDR Minutes 02-08-19.pdf* was submitted with MS31 Monthly Report.
    - The PowerPoint file was too large to include as an attachment to the MS31 Monthly report, but was made available in the LT2 Points Portal, Files Section
      - File Name: *POINTS CDR Slides 2-8-19.pptx*
  - ○ Finalized schedule of site visit for the Joint Readiness Training Center (JRTC) at Ft. Polk, LA for 11-15 April 2019:
    - Trip report will be included with the next monthly report
    - Trip report will include observations on how training is conducted and how it relates to POINTS/JETS
  - ○ Held IPR on 12 February 2019 in Orlando, FL
- 040: Provide Suggested Edits to POINTS Draft CDD: – **In Progress**
  - ○ Continued review of POINTS Draft CDD.
  - ○ Created document to organize the review and research of the draft CDD, and to summarize the references/resources from the CDD:
    - File Name: *CDD & REFERENCE DOCUMENTS 2-4-19.pdf* was submitted with MS28 Monthly Report and documents the review of the draft CDD and summarizes the contents for the references within the CDD.
- 040: Provide Suggested Edits to POINTS Draft CDD: – **In Progress (continued)**
  - ○ Continued reviewing additional reference documents from the POINTS Draft CDD:
    - Continued putting together summaries and key points for each reference document. File Name: *CDD & REFERENCE DOCUMENTS 3-22-19.pdf* was submitted with MS32 Report.
  - ○ Continued reviewing the references and resources listed in the CDD
  - ○ Continued documenting suggested definitions to include in the POINTS Draft CDD, based on the research and based on the review of the JETS Draft CDD:
    - All suggestions are being documented in the CDD recommendations document for the POINTS Draft CDD
  - ○ Reviewed the information assurance (IA) and cybersecurity requirements referenced in the POINTS Draft CDD and associated reference documents:
    - Identified newer reference documents for section 5.1.3 "Net-Ready":
      - Suggested change will be reflected in the CDD recommendations document and is noted below:
        - ○ *Rationale:* As defined in CJCSI 6510.01F (09 Feb 2011), the system is subject to the applicable Information Assurance and Cybersecurity policies, controls, and processes referenced within DoDI 8500.01E "Cybersecurity" (14 Mar 2014), and DoDI 8510.01Chg-2 "Risk Management Framework (RMF) for DoD Information Technology (IT)" (28 Jul 2017)
- 044: Iteratively Refine and Refactor JETS Architecture: – **In Progress**
  - ○ Received additional feedback from JPC-1 on the Phase I deliverables on 15 January 2019 regarding:
    - Expansion of dictionary in Architecture Description
    - Suggested edits
    - Recommendations of CDD compliance
  - ○ Updated the Phase I deliverables per feedback and provided all updated versions on 15 February 2019.

- o Held meeting on 20 February 2019 with IVIR, SimQuest and JPC-1 to conduct live edits for the Phase I deliverables:
    - Summarized meeting minutes were included to the MS 31 Monthly Report as File Name: *20 February 2019 Teleconference v2.pdf*
- o Submitted final Phase I deliverables on 25 February 2019:
    - Final submission included the Phase I final report, Phase I Annexes, and Phase I Supporting Documentation:
        - Additional change requested and re-submitted on 26 February 2019
    - Updates included separating support documentation from main report and main annexes; updating the wording in each annex to better match the CDD; added product links to the LVCG matrix
- o Continued refinement of JETS architecture based on POINTS research
- 045: Demonstration Preliminary MMS FOM: – **In Progress**
    - o Received feedback from JPC-1 on 22 March 2019
        - The demonstration design is approved based on what was presented at the CDR in February.
        - Additional notes for key points to include in the presentation that precedes the demonstration:
            - What specific capabilities are we demonstrating?
            - What does JETS offer that is not currently available?
            - How are we defining JETS?
            - How flexible is the concept to future advances/changes?
            - Why is it better compared to current systems?
            - Why is it needed?
            - Why are we doing the demo?
    - o Updated the FOM:
        - Continued modifying variables to better handle patient form data
        - Continued adding variables to support medical logistics
        - Updated patient injury, treatment, and medication variables
        - Finalized how the FOM will handle the transfer of patient for data for the demonstration system
        - Continued designing bookmark variables for AAR systems
        - Finalized the federation agreements for the system, including how the system will handle time
        - Continued the configuration management of two FOM versions: one that will be used for the demonstration system, and one that will be expanded to cover additional JETS and POINTS capabilities
        - Continued work on the expanded version of the FOM:
            - Began requirements traceability between the FOM and the POINTS and JETS draft CDDs
    - o Coordinated demonstration system design with subcontractors:
        - Held weekly calls with each subcontractor for status updates
        - Created a VPN tunnel to allow remote testing between the subcontractors and the demo system server
        - Continued use of document sharing portal on Zoho for demonstration system team to ensure coordination and to manage version control for code and design documents
        - Finalized the publication/subscribe list for each federate (system):
            - The list identifies which objects and interactions each federate publishes (sends) and subscribes to (receives)
            - The list is used to generate the code to allow each federate to integrate with HLA and communicate through the runtime interface (RTI)
        - Updated the feature list for each federate to track features and completion dates of each feature. The feature list will form the basis of the testing checklists for each of the system tests prior to the final demonstration

- Provided updated code for each federate to connect to the RTI, and to identify how to interact with their variables from the publication/subscribe list
- Conducted initial connection tests on 15 March 2019:
    - All systems have successfully connected to the RTI
    - Future tests will focus on further integration between the systems
- Scheduled hardware integration test for 04 April 2019 in Orlando:
    - All systems will be installed on the demonstration hardware
        - Systems include:
            - HumMod for patient physiology
            - SCM Globe for logistics
            - RESITE for the point of injury simulation
            - Training in Motion for AAR
            - Advanced Female Trauma Training System (AFTTS) for the en route care simulation
    - Test will focus on initial integration tests between systems based on the capabilities developed as of 01 April 2019
    - Results of the test will be reported in the next monthly report
- Continued use of document sharing portal on Zoho for demonstration system team to ensure coordination and to manage version control for code and design documents

- Began and continued developing the point of injury (POI) and en route care (ERC) simulation systems/federates:
    - Virtual patient models are being developed to accurately reflect the female patient type and injuries:
        - One patient model will be used for POI, and one will be used for the ERC simulation.
    - Patient models have been reviewed by a medical SME and are in the process of being updated to reflect the feedback provided
- Updated the primary demonstration design document:
    - Held table-top review of final presentation/demonstration.
    - Added detail to describe each individual interaction between the federates
    - Added detail to denote the major events within each simulation
    - Added detail regarding the overall flow of the demonstration
    - File named below submitted with MS28 Monthly Report:
        - File Name: *POINTS FOM Demo Design 01-27-19.pdf*
    - File named below submitted with MS31 Monthly Report:
        - File Name: *POINTS FOM Demo Design 03-04-19.pdf*
    - Added detail regarding the patient form transfer
    - File named below submitted with MS32 Report.:
        - File Name: *POINTS FOM Demo Design 04-02-19.pdf*

Milestone Progress Detail for the reporting period of 01—April-2019 through 30-June-2019:
- 022: Conduct Front-end Domain Analysis POINTS – **Completed**
    - Completed literature review, analyzed curricula, and updated LVCG technologies
        - Updated the LVCG technology matrix, the document on military doctrine, and the document on healthcare providers
        - Created the LVCG summary report for POINTS
    - JPC-1 provided feedback on the Navy Supplemental interviews that were submitted with the previous monthly report on 12 April 2019
        - Responses to their questions were submitted by IVIR on 12 April 2019
    - Updated and finalized the traceability matrix for the literature research
    - Updated and finalized the military medical doctrine document

- o The following files were submitted with MS36
  - ▪ File Name: *MILITARY MEDICAL DOCTRINE 04.29.2019.docx*
  - ▪ File Name: *RESEARCH TRACEABILITY MATRIX 05.01.2019.xlsx*
- o Requested written feedback from Government on these files within 30 days, by 07 June 2019
- o All completed research files have been uploaded to the LT2 Portal, POINTS collaboration area, Research Documents folder
  - ▪ List of research document files uploaded for review include:
    - • *HEALTHCARE PROVIDERS 03.27.2019*
    - • *MILITARY MEDICAL DOCTRINE 04.29.2019*
    - • *POINTS BIBLIOGRAPHY 12-03-18*
    - • *POINTS LVCG MATRIX 03.27.2019*
    - • *POINTS LVCG SIMULATION SUMMARY 03.27.2019*
    - • *RESEARCH TRACEABILITY MATRIX 05.01.2019*
- o Finalizing the milestone and putting information into the final report and was moved to be tracked in MS42
  - ▪ Tracking of future requests for review will be in MS42
- 026: Develop POINTS Architecture Data Plan and Requirements Definition – **Completed**
  - o Finalized gathering data from POINTS Draft CDD to identify architecture design requirements
  - o Finalized review of additional reference documents from the POINTS Draft CDD
- 032: Sprint Monthly Planning Report, Phase II Month 8 – **Completed**
- 033: Develop POINTS Capability Models – **Completed**
  - o Reviewed the draft CDD to identify capabilities
  - o Began review of the documents related to the Universal Joint Task Lists and architecture requirements uploaded by SimQuest to the LT2 Portal
  - o Continued developing capability models for POINTS
  - o Began review of the capability DoDAF views uploaded by SimQuest to the LT2 Portal
  - o Finalizing the milestone and putting information into the final report will be tracked in MS42
- 034: Conduct Feasibility Study POINTS – **Completed**
  - o Continued plans for feasibility studies for the POINTS architecture
  - o Study to be finalized once DoDAF's are completed
  - o Completed review of the documents related to the Universal Joint Task Lists and architecture requirements uploaded by SimQuest to the LT2 Portal
    - ▪ Review documents with comments have been uploaded to the LT2 Portal, Architecture description folder
  - o Continued plans for feasibility studies for the POINTS architecture
  - o Study to be finalized once DoDAF's are completed
  - o Finalizing the milestone and putting information into the final report will be tracked in MS42
- 035: Develop POINTS Operational System Models – **In Progress**
  - o Reviewed the draft CDD to identify capabilities and related operations
  - o Continued developing operational system models for POINTS
  - o Completed initial review of the operations and systems DoDAF views uploaded by SimQuest to the LT2 Portal
    - ▪ Review documents and comments have been uploaded to the LT2 Portal, Architecture description folder
- 036: Sprint Monthly Planning Report, Phase II Month 9 **– Completed**
- 037: Submitted POINTS Quarterly Report on 25 April 2019 – **Completed**
- 038: Sprint Monthly Planning Report, Phase II Month 10 – **Completed**
- 039: Conduct Site Visits and Critical Design Review POINTS – **Completed**
  - o Conducted site visit to the Joint Readiness Training Center (JRTC) at Ft. Polk, LA on 11-15 April 2019
  - o Trip report was included as an attachment to this report, see attached file for more detail

- File Name: *Ft Polk JRTC Trip Report 4-15-19.pdf*
- 040: Provide Suggested Edits to POINTS Draft CDD – **Completed**
    - Continued review of POINTS Draft CDD
    - Continued reviewing the references and resources listed in the CDD
    - Continued documenting suggested definitions to include in the POINTS Draft CDD, based on the research and based on the review of the JETS Draft CDD
        - All suggestions are being documented in the CDD recommendations document for the POINTS Draft CDD
    - Began review of CDD recommendations provided by SimQuest
    - Finalized review of POINTS Draft CDD
    - Finalized the references and resources listed in the CDD
    - Completed review of CDD recommendations provided by SimQuest
    - Completed documentation suggested definitions to include in the POINTS Draft CDD, based on the research and based on the review of the JETS Draft CDD
        - All suggestions were documented in the CDD recommendations document for the POINTS Draft CDD
        - The CDD recommendations document were uploaded to the LT2 portal, POINTS collaboration area, architecture description folder
            - File name: *IVIR POINTS CDD Recommendations 06.28.2019.docx*
- 041: Sprint Monthly Planning Report, Phase II Month 11 – **Completed**
- 042: POINTS Deliverables – **In Progress**
    - Began finalizing all research documents for inclusion in final report
    - Created final deliverables coordination document to coordinate review dates between IVIR and SimQuest for final products
    - Finalized all research documents for inclusion in final report
        - Research documents are uploaded to the LT2 portal, POINTS collaboration area, Phase II Final Documents for Review folder. JPC-1 review of research documents was requested.
    - Completed review of DoDAF artifacts provided by SimQuest
    - Continued plans for feasibility studies for the POINTS architecture
        - Study to be finalized once DoDAF's are completed
- 043: Final Report – **In Progress**
    - Began outlining the final report
    - Submitted the final report outline to JPC-1 for review
    - Initial review was discussed during the deliverable outline review on 29 May 2019. Government verbally approved the outline as submitted
    - Continued drafting the final report
    - Began filling in sections of the final report
        - Drafting objective summaries
    - Began preparing appendices for the final report
- 044: Iteratively Refine and Refactor JETS Architecture – **Completed**
    - Continued refinement of JETS architecture based on POINTS research
        - Require receipt of created DoDAF's to ensure information is included under the version with recommendations
    - Began review of updated JETS DoDAF views uploaded by SimQuest to the LT2 Portal
    - Finalizing the milestone and putting information into the final report will be tracked in MS42
- 045: Demonstration Preliminary MMS FOM – **Completed**
    - Updated the FOM
        - Continued designing bookmark variables for AAR systems

- Continued the configuration management of two FOM versions: one that will be used for the demonstration system, and one that will be expanded to cover additional JETS and POINTS capabilities
  - The version for the demonstration system has been finalized, all future work on the FOM will be done on the expanded version
- Continued work on the expanded version of the FOM
  - Continued requirements traceability between the FOM and the POINTS and JETS draft CDDs
  - Expanded the DA4700 form and DD1380 form capabilities in the FOM
- The FOM used for the demo has been completed and uploaded to the LT2 Portal for review, under the demo folder
- Continued the configuration management of two FOM versions: one that will be used for the demonstration system, and one that will be expanded to cover additional JETS and POINTS capabilities
- Continued work on the expanded version of the FOM
  - Continued requirements traceability between the FOM and the POINTS and JETS draft CDDs
  - Expanded the DA4700 form and DD1380 form capabilities in the FOM
  - Began biweekly meetings to discuss development effort of the extended FOM
  - Continued biweekly meetings to discuss development effort of the extended FOM
  - Received feedback on the FOM from SimQuest and began incorporating the comments
  - Reviewed the FOM naming conventions and began updating for consistency
- Held weekly calls with each subcontractor for status updates
- Updated the feature list for each federate to track features and completion dates of each feature
  - Updated the feature list based on changes that resulted from the 04 April integration test
- Provided finalized code for each federate to connect to the RTI, and to identify how to interact with their variables from the publication/subscribe list
- Continued use of document sharing portal on Zoho for demonstration system team to ensure coordination and to manage version control for code and design documents
- Continued developing the point of injury (POI) and en route care (ERC) simulation systems/federates
  - Virtual patient model for the POI system has been updated based on SME feedback
  - The POI system UI has been updated to correct some display issues and correct the vital sign values being shown on the screen
  - Virtual patient model for the ERC system has been removed
    - The ERC system will focus on the physical female manikin
- Conducted the initial system integration test on 04 April 2019
  - Consolidated results of the test and provided feedback to subcontractors regarding feature updates and bug fixes
  - Test notes are attached as a separate document to this report
    - See attached file for test notes
      - File name: *Demo Integration Test Notes 04-04-19.pdf*
- Conducted the system Alpha test on 29 April 2019
  - Consolidated results of the test and provided feedback to subcontractors regarding feature updates and bug fixes
  - Test notes are attached as a separate document to this report
    - See attached file for test notes
      - File name: *POINTS Demo Alpha Test Notes 4-30-19.pdf*
- Began tracking bug fixes and feature updates using the Zoho task tracking tool
- Updated the primary demonstration design document

- Updated the design document based on changes made as the result of testing this month provided with MS38 Report
  - File Name: *POINTS FOM Demo Design 05-03-19.pdf*
- o Continued developing the after-action review (AAR) and physiology federates
  - Expanded the DD1380 form capabilities for the AAR federate
  - Finalized the physiology model to show realistic reactions to interventions
- o Conducted interim, internal system tests on 08 May and 15 May 2019
  - Provide notes and test results to subcontractors regarding bug fixes
- o Conducted the system Beta test on 20 May 2019 in Orlando, FL
  - Consolidated results of the test and provided feedback to subcontractors regarding feature updates and bug fixes
    - Test notes were provided as an attachment to MS 38 Report.
      - o File name: *POINTS Demo Beta Test Notes 5-21-19.pdf*
- o Continued tracking bug fixes and feature updates using the Zoho task tracking tool
- o Scheduled a demonstration system dry run for 04 June 2019 in Orlando, FL
  - Began creating the presentation and demonstration script
  - Dry run will focus on the entire presentation and demonstration organization, and will act as a full system test prior to the final demonstration
- o Completed demonstration presentation and script
  - The presentation file was provided by upload to the LT2 portal, with updated diagrams
    - File name: *POINTS Demo Presentation 06-24-19.pdf*
    - File name: *POINTS Demo Presentation 06-24-19.pptx*
- o Conducted system dry run on 04 June 2019 in Orlando, FL
  - Dry run focused on the entire presentation and demonstration organization
  - Provided notes and test results to subcontractors regarding bug fixes
- o Conducted final system test and rehearsal on 12 June 2019 in Gainesville, FL
- o Traveled to Ft. Detrick, MD to conduct final demonstration for JPC-1
  - Arrived on 17 June to set up and tested the system
  - Conducted the demo on 19 June 2019
  - Began organizing and rendering the videos recorded at the demo
- o Continued tracking bug fixes and feature updates using the Zoho task tracking tool
- o Continued finalizing the FOM demo design document.
  - The final document will be included with the final report.
- o Final work on the FOM will be tracked under MS42

Milestone Progress Details for the reporting period of 01-July-2019 through 30-Sept-2019:

PHASE II: POINTS
- 041: Sprint Monthly Planning Report, Phase II Month 11 – Due 07July2019 – **Completed – Submitted 07 July 2019:**
  - o Held weekly program meetings
  - o Held Monthly Sprint Review Meeting
- 042: Final Phase II Deliverables & 043: Final Reports - Due 22 July 2019 – **Completed**
  - o Submitted 22 July 2019 the following files:
    - File Name: *POINTS FINAL REPORT – IVIR.docx*
    - File Name: *Annex A.docx*
    - File Name: *Annex B.docx*
    - File Name: *Annex C.xlsx*
    - File Name: *Annex D.docx*
    - File Name: *Annex E.xlsx*
    - File Name: *Annex F.docx*

- File Name: *Annex G.docx*
- File Name: *Annex H.docx*
- File Name: *Annex I.docx*
- File Name: *Annex J.docx*
- File Name: *Annex K.docx*
- File Name: *Annex L.docx*
- File Name: *Annex M.docx*
- File Name: *Annex N.docx*
- File Name: *Annex O.docx*
- File Name: *Annex P.pdf*
- File Name: *Annex Q.pdf*
  - Feedback received from Government 10 September 2019
  - Submitted updated Annex G for review 12 September 2019
    - Awaiting feedback from Government
- 045: Demonstrate Preliminary FOM – **Completed**

PHASE III

- 047: Architecture Validation – **Postponed**
  - Prepared for internal kickoff
    - Organized details for milestone tasks and deliverables
  - Began decomposing the JETS and POINTS draft CDDs for use case development
  - Based on the updates from the kickoff meeting, the JETS draft CDD will likely be re-written
  - The architecture validation work will be postponed until a new JETS draft CDD is released
- 048: FOM Extended Demonstration – **In Progress**
  - Prepared for internal kickoff
    - Organized details for milestone tasks and deliverables
    - Drafted initial design ideas for discussion at the kickoff to start defining the scope of the trial
  - Began identifying key features and capabilities to include in the demonstration system
  - Created a matrix of capabilities to potentially show in the extended demonstration system
    - The matrix includes capabilities identified in the Phase III Statement of Work (SOW), identified by JPC-1 members, and capabilities derived from these sources
    - The matrix "priority" column is meant to indicate the suggested priority level of each capability in the final extended demonstration system, as determined by the Government
      - Include with High Focus: The capability will be included in the system and will have a high degree of focus during the demonstration; it is an integral part of the system
      - Include with Low Focus: The capability will be included but with a low degree of focus or a low degree of integration in the system
      - Nice to Have: The capability can be included as time and budget allow, but is not required
      - Do Not Include: The capability will not be investigated or developed for the system
    - The following file was submitted with MS54:
      - File Name: *Phase III Capability Matrix 9-30-19.xlsx*
        - IVIR requested feedback fromJPC-1 regarding priority of each item in the matrix, addition of other capabilities , as requested, could be added to the matrix.
        - **Feedback requested by 21 October 2019**
  - Began creating scenarios for the demonstration system
    - Scenarios will be finalized after receiving feedback and guidance on the capability matrix
    - The priority levels of each capability will define the scope of the scenarios
- 049: Program Management, Meetings and Reporting – **In Progress**
  - Held kickoff meeting with Government representatives
  - Began coordination of Weekly and Monthly Project Update Calls
  - Began coordination of platform to share documents with Government

- o Received approval for use of Bridge Software from JPC-1
- 050: Monthly Sprint Report Phase III - Month 1 – **Completed**
    - o Submitted Phase III, Month 1 Sprint Planning Report. Submitted files for draft project plan and quality control plan
    - o The following files were submitted with MS50
        - MS51: File Name*: Phase III Project Plan Draft v1.0 07Aug2019.pdf*
        - MS52: File Name: *Phase III QCP Draftv1 07312019.pdf*
- 051: Project Plan for Phase III – **In Progress**
    - o Submitted Draft v1.0 with MS50 Monthly Report
    - o Updated Draft Project Plan to Draft V2.0
    - o Final Version of the Project Plan Document will be submitted on 04 October 2019
    - o The proposed Microsoft Project Chart will be submitted as an appendix to the report on 04 October 2019
        - IVIR will request **feedback or acceptance on these submittals by 18 October 2019**
- 052: Quality control plan (QCP) for Phase III **– Completed**
    - o Submitted Draft v1.0 with MS 50 Monthly Report
    - o Submitted Final QCP for review with MS53 Report
    - o After review of the QCP, IVIR received a request for clarification on one section of the document on 30 September 2019.
    - o Response to the questions will be sent 01 October 2019
- 053: Monthly Sprint Report Phase III – Month 2**– Completed**
    - o Submitted Phase Three, Month 2 Sprint Planning Report
    - o The following files were submitted with MS53
        - File Name: *Phase III Kickoff Meeting Minutes.pdf*
        - MS 51 File Name: *Phase III Project Plan Draft v2.0 06September2019.pdf*
        - MS 52 File Name: *Phase III QCP Fina1 06September2019.pdf*
- 054: Monthly Sprint Report Phase III – Month 3**– In Progress**
    - o Began Phase III Month 3 Report
- 083: MSE Propagation and Advocacy – **In Progress**
    - o Began identifying stakeholders and coordinating site visits
    - o Began looking into models and process for Advocacy Plan
    - o Held conversations with Kyle Couperus, BSN, MD, CPT, MC, US Army
        - Emergency Medical Physician at Madigan
        - He has expressed interest in providing SME feedback on the Medical Modeling and Simulation Federation Object Model (MMS FOM) being developed for the extended demonstrations system, and providing stakeholder input for the JETS program
    - o Worked with Pitch Technologies US to write an abstract for the 2020 Simulation Innovation Workshop, conducted by the Simulation Interoperability Standards Organization (SISO)
        - The focus is on the modularity aspect of the MMS FOM
        - The abstract was submitted to JPC-1 on 04 October 2019. IVIR requested feedback be received no later than the morning of 11 October 2019 in order to meet the submission deadline.
    - o Began creating a stakeholder analysis spreadsheet
        - The spreadsheet will be used to identify the stakeholders and track development of the relationships and informational pushes
    - o Requested JETS Vision statement from Government

Milestone Progress Detail for the reporting period 01-October-2019 through 31-December-2019:
- 047: Architecture Validation – **Postponed**
    - o The architecture validation work is postponed until a new JETS draft CDD is released
- 048: FOM Extended Demonstration – **In Progress**

- o Received JPC-1 feedback on the Phase III Capability Matrix on 22 October 2019
- o Began and continued creating a scenario and description based on the priorities noted in the capability matrix
  - Created a top-level scenario event flow document that will be presented to JPC-1 during the next monthly meeting on 06 January 2020
  - The event flows are shown as permutations and options based on potential sites and additional systems obtained during the program
  - The file name referencing the scenarios to be discussed follows:
    - File Name: *Top Level Scenario Event Flows.pptx*
      - o Feedback will be requested by 10 January, so it can be discussed at IMSH.
- o Created and compiled libraries from Developer Studio for initial connection testing with the federates
  - Created development environment for a streamlined compile process
- o Created a Git repository for configuration management of the MMS FOM and the code needed for each federate
- o Continued to update and utilize the Git repository for configuration management of the Medical Modeling and Simulation (MMS) Federation Object Model (FOM) and the code needed for each federate
- o Began updating the MMS FOM that was initially created in Phase II of the program
  - Continued cleaning up data types throughout the FOM to ensure consistency and accuracy
  - Began expanding multi-patient support in the FOM
  - Continued expanding multi-patient and multi-learner support in the FOM
  - Continued research on aligning the MMS FOM with xAPI standards for learner data
  - Began and continued research on how to best implement simulation controls
  - Began and continued work on designing how to represent object location (e.g. locations of patients, medical treatment facilities, and vehicles)
  - Continued work on designing how to format object identifiers (e.g. patient ID, scenario ID, learner ID)
  - Began work on better representing treatment objects
- o Created the site identification and selection process for potential sites to host aspects of the extended demonstration system
  - Analysis consists of identifying potential sites, how the sites align to demo capabilities, and what facilities each site can offer
- o Attended the IITSEC conference in Orlando, FL on 2-4 December 2019
  - Copies of some of the presentations are uploaded to the LT2 portal, Phase III collaboration area -> Files -> Conferences -> IITSEC 2019
  - The following files were submitted this quarter:
    - File Name: *IITSEC Trip Report Dec 2019.pdf*
- 049: Program Management – **In Progress**
  - o Continued coordination of Weekly and Monthly Project Update Calls
    - Adjustments made to accommodate Holiday schedules
  - o Provided minutes from weekly meetings
  - o Monthly Project Status Meeting with Government were held
  - o Monthly Project Status Brief Meetings were held
  - o Executed subcontract with Pitch Technologies, US to begin work on the Medical Modeling and Simulation (MMS) Federation Object Model (FOM)
  - o Executed the Subcontractor agreement for the LMS/AAR component
- 051: Project Plan for Phase III – **Complete**
  - o Final Version of the Project Plan Document was submitted on 04 October 2019
  - o Feedback was received on 18 October 2019, with request to add Government Holidays
  - o The file version below has been updated with Federal Holidays

- File Name: *JETS Phase III MS Project Chart v1.1 as submitted 07Nov2019*
  - o JPC-1 was requested to review this version
  - o Final version of the project Plan approved and accepted by JPC-1
- 052: Quality control plan (QCP) for Phase III **– Complete**
  - o Submitted Draft v1.0 with MS50 Monthly Report
  - o Submitted Final QCP for review with MS53 Report
  - o After review of the QCP, IVIR received a request for clarification on one section of the document on 30 September 2019
  - o Response to the questions sent 01 October 2019
  - o JPC-1 accepted with explanation.
- 054: Month 3 Sprint Planning Report – **Complete**
  - o Submitted Phase III Month 3 Report
  - o The following files were submitted with MS54:
    - *Phase III Capability Matrix 9-30-19.xlsx*
- 055: Quarterly Report 6 - **Complete**
  - o Submitted Quarterly Report due 25 October 2019
- 056: Monthly Sprint Report Phase III – Month 4 **– Complete**
  - o Submitted Phase III Month 4 Report
  - o The following files submitted with MS56:
    - File Name: *Trip Report Military Medical Industry Days II.pdf*
    - File Name: *SIW Abstract Modular FOM.pdf*
    - File Name: *JETS Phase III MS Project Chart v1.1 as submitted 07Nov2019*
- 057: Monthly Sprint Report Phase III – Month 5 – **Complete**
  - o Submitted Phase III Month 5 Report
  - o The following files submitted with MS57:
    - File Name: *JETS Phase III MS Project Chart v1.1 as submitted 06Dec2019*
- 058: Monthly Sprint Report Phase III – Month 6 – **In Progress**
  - o Began writing Month 6 Report due 07 January 2020
- 083: MSE Propagation and Advocacy – **In Progress**
  - o Submitted and Received the JETS Phase III Stakeholder Support letter from JPC-1
  - o Received the JETS mission statement from JPC-1 on 22 October 2019
  - o Worked with Pitch Technologies US to write an abstract, and subsequent paper for the 2020 Simulation Innovation Workshop, conducted by the Simulation Interoperability Standards Organization (SISO)
    - The abstract was provided to JPC-1 on 04 October 2019
    - Received approval from JPC-1 to submit the abstract on 10 October 2019
    - The abstract was submitted on 10 October 2019
    - The Modular FOM abstract was accepted on 05 November 2019
    - Began working with Pitch Technologies US to write the draft paper
    - The Modular FOM draft paper and presentation were submitted to the 2020 Simulation Innovation Workshop (SIW), conducted by the Simulation Interoperability Standards Organization (SISO) on 07 December 2019
    - Continued working with Pitch Technologies US to write the final paper and presentation for final submission on 06 January 2020
    - The proposed final versions were presented to JPC-1 for review. Requested feedback be received by 02 January 2020 to meet submission date of 06 January 2020
  - o The following files were submitted with respect to this effort:
    - File Name: *SIW Abstract Modular FOM.pdf*
    - File Name: *SIW Modular FOM Paper.docx*
    - File Name: *SIW Modular FOM Presentation.pptx*
  - o Continued updating the stakeholder analysis spreadsheet

- The spreadsheet will be used to identify the stakeholders and track development of the relationships and informational pushes
- The spreadsheet currently identifies stakeholders who will likely have an interest in JETS, by their position and organization
- Additional stakeholders have been identified, and contact information is being populated
- Began initial conversations with several stakeholders

o Performed an analysis of AMSUS Conference. IVIR will prepare to submit an abstract to present next year

o Attended the Military Medical Industry Days II meeting on 15 October 2019
- During the trip, met with several stakeholders and Government agencies that may be involved with the JETS program
- Notes on the meetings and identification of the agencies are in the trip report
- A trip report was submitted with the following file name:
  - File Name: *Trip Report Military Medical Industry Days II.pdf*

o Registered for 2nd Operations Military Medicine conference to be held 22-23 January 2020 in San Diego
- Continued updating the stakeholder analysis spreadsheet and reaching out to stakeholders
- Preparing to brief individual stakeholders at Operational Military Medicine conference Jan 22-23
- Continue to reach out to potential stakeholders in Military agencies
- Planning briefings to stakeholders in attendance

2. Future Plans

Present a brief statement of plans or milestones planned for the next quarter. If any of the plans deviate from the original approved SOW (e.g., new or modified tasks, objectives, experiments, etc), they will require review by the Grants Officer's Representative and final approval by USAMRAA Grants Officer through an award modification prior to initiating any changes.

Milestones to be worked during the next Year (01 January 2020 - 31 December 2020)
PHASE III
- 047: Architecture Validation
  o On Hold pending release of updated JETS Draft CDD from J7
- 048: FOM Extended Demonstration
  o Review the scenario event flows during the monthly meeting (scheduled for 06 January 2020)
  o Adjust the scenarios based on site and system availability
  o Continue working on the MMS FOM
    - Update the patient module based on further research and cleanup of treatments, injuries, and equipment
    - Implement updated Simulation Control interactions in the MMS FOM
    - Begin outlining a new assessment module for the FOM
    - Finalize the guidelines for creating object identifiers in the FOM
    - Finalize the guidelines on representing object locations in the FOM
    - Finalize the guidelines for representing treatment objects in the FOM
  o Identify and coordinate site visits
- 049: Program Management
  o Continue to publish minutes from weekly (or otherwise) Program update calls.
  o Continue to initiate Sub-Contractor Agreements and Statements of Work
  o Schedule Program Update Calls as agreed upon
  o Coordinate scheduling of Monthly calls.
  o Begin to populate LT2 portal for Phase III, and keep updated
- 058: Monthly Sprint Report Phase III – Month 6

- o Complete and submit Report due 07 January 2020
- 059: Annual Report 2
  - o Complete and submit Annual Report 2 – Due 25 January 2020
- 060: Monthly Sprint Report Phase III – Month 7
  - o Write and submit Month 7 Report due 07 February 2020
- 061, 062, 064, 065, 066, 068, 069, 070, 072, 073: Monthly Sprint Reports Phase III
  - o Write and submit according to Milestone Payment Schedule.
- 074: Monthly Sprint Report Phase III – Month 18
  - o Begin writing report
- 063, 067, 071: Phase III Quarterly Reports
  - o Write and submit reports according to Milestone Payment Schedule
- 075: Annual Report 3
  - o Begin writing report
- 083: MSE Propagation and Advocacy
  - o Continue populating the stakeholder analysis spreadsheet
    - ▪ Identify names and contact information for each stakeholder position identified
    - ▪ Continue contacting stakeholders
  - o Submit final paper for the 2020 SIW conference on 06 January 2020
  - o Attend 2nd Operations Military Medicine conference to be held 22-23 January 2020 in San Diego
    - ▪ Hold briefings to stakeholders in attendance

3. Problems / Issues

Any change that is substantially different from the original approved SOW (e.g., new or modified tasks, objectives, experiments, etc.) will require review by the Grants Officer's Representative and final approval by USAMRAA Grants Officer through an award modification prior to initiating any changes.

a. Current Problems / Issues

Provide a description of current problems or issues that may impede performance or progress of this project along with proposed corrective action. This may include administrative, technical, and/or logistical issues.

For an award that includes the recruitment of human subjects for clinical research or a clinical trial, discuss any problems or barriers encountered, if applicable, and what has been done to mitigate those issues. Discussion may highlight enrollment problems, retention problems, and actions taken to increase enrollment and/or improve retention.

- There are no current problems or issues.

b. Anticipated Problems / Issues

Provide a description of anticipated problems or issues that have a potential to impede performance or progress. Also provide course of actions planned to mitigate problems or to take should the problem materialize.

- There are no anticipated problems or issues that have a potential to impede performance or progress.

4. Financial Health

Comment on the financial health of the study. Was the study financially on track during this quarterly reporting period and cumulatively for completion as proposed within the period of performance? If not, describe the cause(s), whether this will have a short-term or long- term impact, the likelihood this can be overcome, and provide remediation

strategy. Provide amount expended this quarter and cumulatively. State if there was any major equipment procured, sub-award implemented, and/or travel conducted.

- The program is on schedule
- The program is within the period of performance, and within budget during this annual reporting period.
- Total expended this year (2019): $1,287,969.99
- Total cumulative amount expended: $ 2,199,276.30
- No major Equipment was procured during this year
- Amount spent on Materials during this year (2019): $ 65,482.68
- Subcontractor tasks per Statement of Work Assignments are all proceeding
- Travel incurred during this year: $ 26,589.71

5. **Personnel Effort**

   Provide names of current staff along with their roles and percent effort of each on this project. Add additional rows if necessary to list the complete team. If there is more than one project on this award, breakdown according to each project (one table per project).

Personnel	Role	Percent Effort
Ms. Dee Kuenzig	Program Manager	56.7%
Ms. Catherine Strayhorn	Principal Investigator	51.0%
Mr. William Lewandowski, Jr.	Sr. Systems Engineer	61.3%
Ms. Erin Honold	Biomedical/Systems Engineer	69.6%
Mr. Ray Shuford	Sr. Researcher	34.8%
Mr. Dave Litteral	SME – Military Medicine	16.1%
Ms. Mary O' Hara	Contract Administration	7.7%
Ms. Bernice Bell	Administration	4.5%

6. **Protocol and Activity Status**

   For awards involving the use of human subjects, use of human cadavers, and/or use of animal subjects, prepare a summary in accordance with the following subsections. For all other awards, including those involving the use of human anatomical substances (such as tissue or cells or identifiable private information), mark as directed below.

   a. **Human Use Regulatory Protocols**

   <u>TOTAL PROTOCOLS:</u> State the total number of human use protocols required to complete this project (e.g., 5 human subject research protocols will be required to complete the Statement of Work."). If not applicable, write "No human subjects research will be performed to complete the Statement of Work."

   - No human subjects research will be performed to complete the Statement of Work (SOW).

   <u>PROTOCOLS:</u> List all human use protocols to be performed to complete the project, an include approved target number for clinical significance, followed by type of submission and type of approval with associated dates, and performance status for each.

   - Not applicable

- No human subjects research will be performed to complete the Statement of Work (SOW).

    Protocol [HRPO Assigned Number]:
    Title:
    Target required for clinical significance:
    Target approved for clinical significance:
    Submitted to and Approved by:
    Provide bullet point list of protocol development, submission, amendments, and approvals (include IRB in addition to HRPO).

    STATUS: Provide bullet point list of performance and/or progress status relating to the above protocol and discuss recruitment number, enrollment number, drop outs, disqualified, etc. Discuss any administrative, technical, or logistical issues that may impact performance or progress of the study (e.g. slow enrollment, large dropouts, or adverse events) for the above HPRO approved protocol.

b. **Use of Human Cadavers for RDT&E, Education or Training**

"Cadaver" is defined as a deceased person or portion thereof, and is synonymous with the terms "human cadaver" and "post-mortem human subject" or "PMHS." The term includes organs, tissue, eyes, bones, arteries or other specimens obtained from an individual upon or after death. The term "cadaver" does not include portions of an individual person, such as organs, tissue or blood, that were removed while the individual was alive (for example, if a living person donated tissue for use in future research protocols, that tissue is not considered a "cadaver" under this policy, regardless of whether the donor is living or deceased at the time of tissue use).

TOTAL ACTIVITIES: State the total number of RDT&E, education or training activities that will involve cadavers. If not applicable, write "No RDT&E, education or training activities involving human cadavers will be performed to complete the Statement of Work (SOW)."

- No RDT&E, education or training activities involving human cadavers will be performed to complete the Statement of Work (SOW).

ACTIVITIES: Provide the following information in a bulleted list for all RDT&E, education or training activities involving human cadavers conducted or supported during the quarter:
- Not applicable
- No RDT&E, education or training activities involving human cadavers will be performed to complete the Statement of Work (SOW).

c. **Animal Use Regulatory Protocols**

TOTAL PROTOCOLS: State the total number of animal use protocols required to complete this project (e.g., 2 animal use research protocols will be required to complete the Statement of Work.). If not applicable, write "No animal use research will be performed to complete the Statement of Work."

- No animal use research will be performed to complete the Statement of Work (SOW).

PROTOCOLS: List all animal use protocols to be performed to complete the project, include approved target number for statistical significance, followed by type of submission and type of approval with associated dates, and performance status for each.

- Not applicable
- No animal use research will be performed to complete the Statement of Work.

  Protocol [ACURO Assigned Number]:
- Not applicable

  Title:
  Target required for statistical significance:
  Target approved for statistical significance:
  Submitted to and Approved by:
  Provide bullet point list of protocol development, submission, amendments, and approvals (include IACUC in addition to ACURO).

STATUS: Provide bullet point list of performance and/or progress status relating to the above protocol and discuss any administrative, technical, or logistical issues that may impact performance or progress of the study (e.g. animal use protocol need revision to minimize animal suffering, animal protocol modification to include additional staff) for the above ACURO approved protocol.

<u>Annual Business Status Report for</u>
MTEC-17-07-JETS-03 Prototype of Joint Evacuation and Transport Simulation (JETS) System
Research Project No. 2018-649-001
EGS# MT17007.03
Reporting Period: Effective Date – 01 January 2019 through 31 December 2019

<u>MTEC Research Project Awardee</u>
Catherine Strayhorn, CEO
IVIR Inc.
1990 Main Street, Suite 750
Sarasota, Fl. 34236
941-961-0627
cstrayhorn@ivirinc.com

<u>Research Project Technical POC</u>
William Lewandowski
IVIR Inc.
1990 Main Street, Suite 750
Sarasota, Fl. 34236
304-283-3487
blewandowski@ivirinc.com

Submitted: **Original Report Date: January 24, 2020**
Modified for new MTEC report template, resubmitted May 27, 2020

1. CURRENT STAFF

Personnel	% of Effort on project
Program Manager - Ms. Dee Kuenzig	56.7%
Principal Investigator - Ms. Catherine Strayhorn	51.0%
Sr. Systems Engineer – Mr. William Lewandowski Jr.	61.3%
Biomedical/Systems Engineer – Ms. Erin Honold	69.6%
Sr. Researcher – Mr. Ray Shuford	34.8%
SME – Military Medicine – Mr. Dave Litteral	16.1%
Researcher – Mr. Sam Hopkins	7.4%
Contract Administration -Ms. Mary O'Hara	7.7%
Administration – Ms. Bernice Bell	4.5%

2. CURRENT EXPENDITURES

DIRECTIONS: FILL OUT TABLE A OR B DEPENDING ON CONTRACT TYPE. TABLE A IS FOR COST REIMBURSBALE CONTRACTS AND TABLE B IS FOR FIX PRICED CONTRACTS.

A. Cost Reimbursable Contracts: Complete only if your contract is Cost Reimbursable or Cost Plus Fixed Fee.

Expenditures should be reflective of cost incurred to date, not exceeding awarded project ceiling. Expenditures should coincide with the latest invoice for the reporting period. For cost reimbursable contracts please use the table below.

Contract Expenditures	Current YR Expenditures	Cumulative To Date Expenditures
Labor (Personnel and Fringe)	$ 419,748.27	$ 724,475.97
Supplies/Materials	$ 65,482.68	$ 78,416.68
Travel	$ 26,589.71	$ 46,872.95
Equipment	$ 0	$ 0
Subcontractors and Consultants	$ 284,764.87	$ 501,315.70
Other Direct Costs	$ 16,930.99	$ 18,442.77
Indirect Costs	$ 363,060.66	$ 635,513.27
Fee	$ 111,392.92	$ 194,238.96
Total	$ 1,287,970.00	$ 2,199,276.30

3. **STATUS OF MILESTONES** All project milestones from the Milestone Payment Schedule, in the project award, should be accounted for below.

MTEC Milestone Number	Milestone Description	Due Date	% Completed this Reporting Period	Cumulative % Complete
Phase I				
1	Contract Award	23Jan2018	0%	100%
2	Sprint Planning Meeting Phase I- Month 1	22Feb2018	0%	100%
3	Generate Project Plan	22Feb2018	0%	100%
4	Sprint Planning Meeting Phase I – Month 2	22Mar2018	0%	100%
5	Sprint Planning Meeting Phase I – Month 3	07May2018	0%	100%
6	Conduct Front End Domain Analysis	29Jun2018	0%	100%
7	First Quarterly Report	25Apr2018	0%	100%
8	Sprint Planning Meeting Phase I – Month 4	07Jun2018	0%	100%
9	Site Visits to: Ft. Rucker, WPAFB, TRANSCOM	29Jun2018	0%	100%
10	Spring Planning Meeting Phase I – Month 5	06Jul2018	0%	100%
11	Develop JETS Architecture Data Plan	31Jul2018	0%	100%
12	Develop JETS Capability Models	31Jul2018	0%	100%
13	Develop JETS Operational Systems Models	31Jul2018	0%	100%
14	Technical Feasibility Studies	31Jul2018	0%	100%
15	Provide Recommended Edits to the JETS CDD	31Jul2018	0%	100%
16	Spring Planning Meeting Phase I – Month 6	07Aug2018	0%	100%
17	Quarterly Report 2	25Jul2018	0%	100%
18	Final Deliverables Phase I	31Aug2018	0%	100%
Phase II				
19	Project Plan	07Spet2018	0%	100%
20	Sprint Monthly Planning Report – Phase II, Month 1	07Sept2018	0%	100%
21	Sprint Monthly Planning Report – Phase II, Month 2	05Oct2018	0%	100%
22	Conduct Front End Domain Analysis POINTS	29Apr2019	48.5%	100%
24	Quarterly Report 3	25Oct2018	0%	100%
23	Sprint Monthly Planning Report – Phase II, Month 3	07Nov2018	0%	100%
25	Sprint Monthly Planning Report- Phase II, Month 4	07Dec2018	0%	100%
27	Sprint Monthly Planning Report – Phase II, Month 5	07Jan2019	62.7%	100%
26	Develop POINTS Architecture Data Plan and Requirements Definition	29Apr2019	90%	100%
29	Quarterly Report 4	25Jan2019	100%	100%
30	Annual Report	25Jan2019	100%	100%
28	Sprint Monthly Planning Report – Phase II, Month 6	07Feb2019	100%	100%
31	Sprint Monthly Planning Report – Phase II, Month 7	07Mar2019	100%	100%

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32	Sprint Monthly Planning Report – Phase II, Month 8	05Apr2019	100%	100%
37	Quarterly Report 5	25Apr2019	100%	100%
36	Sprint Monthly Planning Report – Phase II, Month 9	07May2019	100%	100%
33	Develop POINTS Capability Models	30May2019	97.8%	100%
34	Conduct Technical Feasibility Studies for POINTS	30May2019	100%	100%
38	Sprint Monthly Planning Report – Phase II, Month 10	07Jun2019	100%	100%
35	Develop POINTS Operational Systems Models	27Jun2019	99.3%	100%
39	Conduct Site Visits and Critical Design Review POINTS	29Apr2019	61.1%	100%
40	Provide Suggested Edits to POINTS Draft CDD	27Jun2019	79.0%	100%
41	Sprint Monthly Planning Report – Phase II, Month 11	08Jul2019	100%	100%
42	Final Deliverables Phase II	22Jul2019	100%	100%
43	Final Reports	22Jul2019	100%	100%
44	Iteratively Refine and Refractor JETS Architecture	30May2019	82.0%	100%
45	Demonstrate Preliminary MMS FOM	27Jun2019	63.2%	100%
Phase III				
46	Phase III Contract Award Executed	01Jul2019	100%	100%
47	Architecture Validation * On Hold – Date will be modified through contract Mod once modified Draft CDD is received.	28Feb2020*	9.7%	0%
48	Phase III FOM Extended Demonstration	30Jun2021	6.8%	6.8%
49	Program Management, Meetings and Reporting	07Jul2019	27%	27%
50	Monthly Sprint Report Phase III – Month 1	07Aug2019	100%	100%
51	Project Plan	07Aug2019	100%	100%
52	Quality Plan	07Aug2019	100%	100%
53	Monthly Sprint Report Phase III – Month 2	07Sept2019	100%	100%
54	Monthly Sprint Report Phase III – Month 3	07Oct2019	100%	100%
55	Quarterly Report 6	25Oct2019	100%	100%
56	Monthly Sprint Report Phase III – Month 4	07Nov2019	100%	100%
57	Monthly Sprint Report Phase III – Month 5	07Dec2019	100%	100%
58	Monthly Sprint Report Phase III – Month 6	07Jan2020	85%	85%
59	Annual Report 2	25Jan2020	5%	5%
60	Monthly Sprint Report Phase III – Month 7	07Feb2020		
61	Monthly Sprint Report Phase III – Month 8	07Mar2020		
62	Monthly Sprint Report Phase III – Month 9	07Apr2020		
63	Quarterly Report 7	25Apr2020		
64	Monthly Sprint Report Phase III – Month 10	07May2020		
65	Monthly Sprint Report Phase III – Month 11	07Jun2020		
66	Monthly Sprint Report Phase III – Month 12	07Jul2020		
67	Quarterly Report 8	25Jun2020		
68	Monthly Sprint Report Phase III – Month 13	07Aug2020		
69	Monthly Sprint Report Phase III – Month 14	07Sept2020		
70	Monthly Sprint Report Phase III – Month 15	07Oct2020		

71	Quarterly Report 9	25Oct2020		
72	Monthly Sprint Report Phase III – Month 16	07Nov2020		
73	Monthly Sprint Report Phase III – Month 17	07Dec2020		
74	Monthly Sprint Report Phase III – Month 18	07Jan2021		
75	Annual Report 3	25Jan2021		
76	Monthly Sprint Report Phase III – Month 19	07Feb2021		
77	Monthly Sprint Report Phase III – Month 20	07Mar2021		
78	Monthly Sprint Report Phase III – Month 21	07Apr2021		
79	Quarterly Report 10	25Apr2021		
80	Monthly Spring Report Phase III – Month 22	07May2021		
81	Monthly Sprint Report Phase III – Month 23	07Jun2021		
82	Final Report Summary Phase III (Draft)	07Jul2021		
83	MSE Propagation Advocacy	30Jun2021	3%	3%
84	Final Deliverables	30Jul2021		

4. DEVIATION FROM PROJECT PLAN

Any major deviations from the agreed to project plan shall be explained with a discussion of proposed actions to address the deviations.

The original project plan showed MS47 with a completion date of 28Feb2020. At the Kickoff meeting with JPC-1, we were advised to put this on hold pending receipt of the modified Draft CDD.

**Please name this annual report file as EGS#_Annual Report_Y# (For example MT160001.01_Annual Report_Y2)
Please submit as a PDF file.
Please make sure to fill in the page number on page 3 Table of Contents.
Don't forget to submit an updated Quad Chart as well. Please name the Quad chart file as EGS#_Quad Chart_Y#.**

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