

Curriculum Vitae

Anthony G. Micale

BSME, MBA

Top Secret Clearance

TS/SCI – Special Intelligence (SI) Talent Keyhole (TK)

**Department Of Defense (DOD)
Secret Clearance**

Partner

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Overview

Expertise, Fact-Finding, Depth and Breadth

Forensic Expert

Excellent working relationships with legal counsel
Work with senior leadership

Work on highly sensitive and complex issues
Work with senior customer leadership

Major Organizational Interface

McDonnell Douglas Office of General Counsel
National Reconnaissance Office
United States Air Force

American Airlines Senior Leadership
Delta Airlines Senior Leadership
Missile Defense Agency

Forensic Investigation

Documentation review
Failure root cause investigation
Engineering corrective action definition
Transcript review
Process review
Event, Incident or Accident timeline mapping

Event recreation
Identification of design deficiencies that result in failure
Design recommendations for desired performance
Fact finding analysis
Human factors assessment

Automotive Development

Vehicle controls design
Throttle control design
Antilock Braking Systems (ABS) development
Vehicle emissions systems development
Gasoline fueled vehicle development
Federal emission compliance and regulations
Airbag deployment systems

Engine design and control
Transmission control
Conventional brake control
CARB emissions compliance and regulations
Natural gas fueled vehicle development
Vehicle safety systems development
Emergency fuel shut off systems

Space Launch Vehicle Design, Construction and Operations

Flight and ground systems design
Launch countdown control room operations
Asphyxiating gas use and human interaction
Design of flight components
Hazardous gas detection
Cryogenic system design and use

Hazardous materials handling
High pressure gas system design and use
Hydraulic system design and use
Human work on flight and ground systems
Oxygen, Hydrogen, Hypergolic, Nitrogen, Helium systems
Safety and handling of liquid hydrogen and liquid oxygen

Aircraft Design, Certification, Safety, Incident and Accident Corrective Action, Maintenance and Operation

Manager Accident and Incident Review Board
Flight safety assessment
Accident and incident root cause discovery
Aircraft Certification
Flight Operation

Fuel systems design
Flight control systems design and operation
Corrective action definition
Aircraft maintenance requirements
Analysis of flight and voice data

Design, Manufacturing, Machining and Inspection

Understanding of complex technical drawings
Computer aided analysis
Finite element analysis for material stress
Computational heat transfer analysis
CMM inspection (Coordinate Measurement Machine)
Local control with embedded software

Engineering revision and drawing change process
Computer Aided Design (CAD)
Computational Fluid Dynamics (CFD)
CNC (Computer Numeric Control) machining
Electro-Mechanical Systems
Conversion of drawings from various CAD systems

Employment History

Diverse Corporate Background

The Aerospace Corporation, El Segundo, CA <i>Senior Project Engineer</i> Space Launch Operations DOD Top Secret Clearance	Aug 2010 to Present
United Launch Alliance, Littleton, CO <i>Space Mission Lead</i> Product Line Chief Engineering Office DOD Top Secret Clearance	Apr 2009 to Aug 2010
Boeing Space Systems / United Launch Alliance, Vandenberg Air Force Base, CA (ULA: a merger organization between Lockheed Martin and Boeing) <i>Principal Engineer</i> Delta IV Space Launch Vehicle Division DOD Clearances	Feb 2003 to Apr 2009
Development Production and Machine Inc., Buellton, CA <i>Owner and Engineer</i> Civilian, Commercial, Space Product Engineering	Mar 2001 to Feb 2003
Vetronix Corporation, Santa Barbara, CA <i>Lead / Project Manager</i> Automotive Diagnostics and Maintenance Development Group	Jan 1999 to Mar 2001
ASHA Corporation, Santa Barbara, CA <i>Engineering Lead</i> Automotive Traction Control Research and Development Section	Feb 1998 to Jan 1999
Ford Motor Company, Dearborn, MI <i>Engineer and Project Lead</i> Powertrain, Chassis and Advanced Powertrain Groups	Oct 1991 to Feb 1998
McDonnell Douglas Corporation, Long Beach, CA <i>Engineer / Specialist Manager</i> Aircraft Safety Incident and Accident Resolution Board Manager	Jan 1986 to Oct 1991
Hi Temp Insulation, Camarillo, CA <i>Product Engineer (full time senior engineer position)</i> Aircraft, Space and Commercial Applications Division (Employment was concurrent with education Jun 1981 to Apr 1985)	Jun 1981 to Jan 1986
Teledyne Electronics, Newbury Park, CA <i>Member Technical Staff (summer position)</i> Mechanical Engineering Department	Jun 1982 to Sep 1982

Work Performed

Aircraft, Automotive, Space, Military and Civilian

Aircraft – Civil Aviation

- Engineering lead for commercial airliner accident and incident resolution team
- Engineering interface to Office of General Council at McDonnell Douglas for civilian aircraft incidents and accidents
- Interface to corporate pilots for determination of flight crew operational errors
- Engineering team lead for the study and analysis of aircraft incidents and accidents
- Identification and resolution of aircraft manufacturing issues
- Incident and accident risk assessment
- Development of operational changes and limitation to allow for design deficiencies
- Assessment of component failures and determination of root cause to establish interim and final corrective action for return to flight of civilian commercial aircraft
- Conduct Failure Mode and Effects Analysis (FMEA)
- Data review and pedigree studies of failed components
- Engineering of flight control systems on civilian airliner (MD 11)
- Design of components to meet functional requirements
- Jet engine propulsion systems engineering of civilian aircraft (MD 80)
- Analysis of engine performance to vehicle interfaces on Pratt and Whitney JT8D-217C jet engine
- Design and flight test of experimental aircraft equipment for flight control systems
- Flight control system certification
- Design, flight test and certification of fuel and ice detection systems
- Project engineer for airborne ice detection systems
- Design of aircraft cabin pressure control systems
- Aircraft thermal and fire shield design, development and production (Boeing 757)

Aircraft – Military Aviation

- JDAM Bomb early detonation investigation and assessment
- Computer simulated heat transfer analysis of airborne electronic equipment (E-2C Hawkeye radar aircraft)
- Development engineer and project lead for numerous aerospace thermal and radiation protection systems
- Design of aircraft thermal and radiation protection systems (B1 strategic bomber, F/A-18 fighter attack aircraft)
- Computer simulation with NASA Sinda/Sinflow nodal heat transfer analysis to develop energy management and thermal insulation system for air borne laser systems (Analysis proven correct in subsequent testing)
- Aircraft thermal and fire shield design, development and production (F-18, KC-135)
- Supported testing of various radiation and thermal protection systems for space, aircraft and ground applications
- Design of electronics packaging for aircraft
- Testing of aircraft components for acceptability

Work Performed - Continued

Aircraft, Automotive, Space, Military and Civilian

Automotive

- Development of advanced powertrain engine control systems
- Development and optimization of catalytic converter chemical reaction for emissions reduction
- Utilization of Computational Fluids Dynamics (CFD) modeling and nodal heat transfer analysis to establish best fluid flow and thermal reactance of catalysts
- Laboratory and field testing of Engine Control Unit (ECU) programming
- Validation and calibration of air fuel control system for best engine power output and best exhaust gas after treatment by catalytic converters
- Design of automobile emission control systems to comply with the Federal Clean Air Act (CAA) and California Air Resources Board (CARB) regulations
- Car powertrains engineering project lead for production of new Modular V8 engines
- Development of engine control systems for new natural gas powered engine (5.4L F250 and Econoline van)
- Obtained approval for proposals of vehicle powertrain programs up to \$200M
- Research and Development of new traction control systems and components
- Design and test of traction control systems with hydraulic actuation
- Design, prototype build and test of various new automotive systems
- Conduct customer evaluations of new automotive systems
- Established the need, obtained and interpreted the results for Finite Element Analysis (FEA) for stress on modified powertrains
- Coordination with Ford and Saleen for implementation of traction control systems into production vehicles

Space

- Development of probable failure modes and risk mitigation steps for off nominal conditions
- Identified and ranked risk to the flight mission for numerous technical deficiencies of space flight vehicles
- Defined the probability of occurrence and the consequence for anomalous conditions on space flight vehicles
- Deep documentation fact finding review
- Failure investigation and reporting
- Assessment of complex technical issues
- Proven working knowledge on diverse systems and system interactions for the test and launch verification process
 - Ground Support Equipment (GSE)
 - Space vehicle systems
 - Propulsion systems
 - Avionics systems
 - Software and control systems
- Satellite processing experience
 - Compliance with specifications
 - Development of new ground support equipment design for hypergolic fuel to meet satellite requirements
 - Management of the build of new ground support equipment
- Safety and Mission assurance with progressively increasing experience
 - Implementation of safety and mission assurance processes
 - Development and verification of large mission assurance plans for first west coast Delta IV Heavy vehicle launch
- Design of thermal and radiation protection packages for space applications
- Specification of data needed to understand the anomalous conditions
- Analysis of data to determine anomaly root cause

Technical Capability

Capability Overview

Complex problem evaluation and analysis. Assessment of many system interactions for fluids mechanical, avionics, software and power

Investigation expertise
Failure root cause analysis
Fishbone analysis
Failure Mode and Effects Analysis (FMEA)

Engineering design
Engineering analysis
Remote control of hazardous operations
Heat transfer analysis

Technical Program and Project Management

- Presentation of various management and customer reviews including

Preliminary Design Review (PDR)
Critical Design Review (CDR)
Engineering Review Board (ERB)

Change Control Board (CCB)
Technical Information Meeting (TIM)

- Management of the design and development process
- Staff member of the Chief Engineers Office for the Delta IV Space Launch vehicle
- Implementation of mission assurance and safety imperatives with a 600 person design team
- Management of multiple cross functional teams
- Presentation of numerous technical briefings to senior leadership, customers and US government
- Strong team building and interpersonal skills
- Project budget management \$57M (use of earned value process)
- Development of the viability to proceed with failures and deficiencies with use of trade-offs and risk assessment
- Development and implement large program schedules
- Program management of software development for PC and internet based systems

Software development
Testing of PC based software applications
Concept definition
Software Beta testing

Coordinated product requirements definition
Generation scope of works
Established software interface to databases

Leadership

Management

- Progressive experience in engineering and management of critical and diverse systems
- Proven experience delivering systems-capability by managing large groups of employees and leads
- Provide technical group leadership, coaching and mentorship of leads and engineers as group manager
- Coordination of technical issues through with Program Office, Aerospace and Air Force
- Managed launch control room activities for Delta II, Delta IV and Atlas IV including Crew Certification for Launch and Wet Dress Rehearsal (WDR)
- Integration of three different launch vehicle processing methods and development of common best practices (Delta II, Delta IV and Atlas IV)
- Technical group lead of the following Ground Systems Equipment (GSE) sections concurrently:

Cryogenics Section
Pneumatics Section
Umbilical Engineering Section

Hydraulics Section
Environmental Control Systems Section

- Management of personnel with ability to build a strong cohesive team able to perform at a high level in a stressful, demanding environment

Staffing plans
Dismissal
Handling of sensitive personnel issues

Recruitment
Performance evaluation

- Leader of anomaly resolution teams (data gathering, data analysis and root cause definition)
- Development of technical team consensus for issue resolution
- Lead of technical discussions leading up to consensus and team polling (Go / No-Go) for flight
- Ground systems technical lead of three Vandenberg Air Force Base launch pads for propulsion, environmental controls and umbilical system

Presentation Skills

- Numerous high-value / high importance presentations to internal and external customers
- Development of multi-media presentation for clear and understandable demonstrations of complex issues
- Time line development with visually understandable storyboards
- Failure mode discovery process – Fishbone analysis charts
- PowerPoint presentation for easy understanding of technical issues, method and conclusions

Background

Education

SEAK Expert Witness Training	2015
SEAK Advanced Testifying Skills for Experts: The Master's Program	2015
Kaizen Six Sigma Training for Root and Direct Cause Analysis	2010
Automotive Vehicle Dynamics Training - (Bondurant School)	1997
Masters Business Administration (MBA), Pepperdine University, Malibu, CA	1989
Bachelors of Science in Mechanical Engineering (BSME), University of California, Santa Barbara	1985

Recognition – Awards – Patents

Numerous awards and recognition
Outstanding performance appraisals – ULA and Ford Motor Company
Customer Driven Quality Award – Ford Motor Company
Letters of Recognition – Boeing and Martin – Marietta Aerospace
Patent Submitted – Internal Combustion Engine Throttle Based Air / Fuel Control Augmentation System

References

Available upon request

Appendix: Job Assignments

The Aerospace Corporation

NASA Space Launch System (SLS)

- Lead of ground system studies for NASA on the next manned space vehicle (Space Launch System - SLS)
- Developed architecture concepts for command and control of the next manned space vehicle
- Integrated command and control of the Space Launch System first stage with the United Launch Alliance Delta IV second stage
- Lead of a NASA and Aerospace Corporation group to define function of the next manned space vehicle emergency safing and securing system
- Ground system safety assessment for manned flight vehicle

U.S. Department of Defense Missile Defense Agency (MDA)

- Subject matter expert for various Missile Defense Agency space vehicles systems
- Detailed reviews (pedigree) of components and system on counter measures, kill and target vehicles
- Independent verification and validation of space vehicles from various companies
- Independent verification and validation of components for space vehicles
- Evaluation of major and minor contractors as suppliers of space vehicle hardware to the US government:

MIT Lincoln Laboratory
Orbital ATK Inc.
The Boeing Company

The Raytheon Company
United Launch Alliance
Lockheed Martin

- On-site evaluations of major contractors and sub-contractors in the following areas:

Design
Process
Capability Assessment
Manufacture

Flight Failure
Component Failures
Counterfeit Parts

- Performance of a variety of special studies to establish mission assurance
- Leader of the high frequency saturation study of an Inertial Measurement Unit (IMU) gyroscope
- Participation in numerous preliminary and critical design reviews on projects such as space vehicle design, kill vehicles and thruster design
- Monitored console operations for multiple Missile Defense Agency target intercept space flight missions

SpaceX Falcon 9

- Evaluation of a new launch pad design to establish safety and risk to personnel and spacecraft
- Member of The Aerospace Corporation team that developed certification requirements for a new US government launch provider
- Monitored console operations for launches from Cape Canaveral, FL

United Launch Alliance (ULA) Delta IV

- Monitored console operations for launches from Cape Canaveral, FL and Vandenberg Air Force Base, CA
- Developed and taught a training program that covered all aspects of Delta IV space launch (training program was provided to US Air Force and The Aerospace Corporation personnel)
- Member of the independent assessment team for first use new rocket engine start strategies where over 450 possible adverse effects were evaluated as a result United Launch Alliance implement alternate design and operation

Appendix: Job Assignments

Boeing and United Launch Alliance (ULA)

- Mission Lead for the Delta IV Product Line Chief Engineers Office providing technical coordination and oversight of vehicle and ground issues to maintain technical and scheduled launch capability
- Support of numerous launch operations by providing anomaly-resolution team leadership as Vehicle Systems Engineer Lead at Delta IV launch sites and from the Denver home office launch support center (VSE and DENVER1)
- Technical review of design and operational changes for mission assurance and success.
- Approval authority for design changes for the mission assurance group
- Provide program direction to the factory and launch sites for implementation of design and design changes
- Coordination among four Design Center PDT (Product Development Team) Chief Engineers and engineering groups to define the launch site qualification test plan (including all test objectives for a series of tests leading to first launch)
- Lead of launch site modifications Systems Readiness Review (SRR) for Delta IV Heavy derivative space launch vehicle
- Definition and execution of the processes perform for launch sites
- Breadth and depth review of all launch site ground systems
- Development of launch site activation test approach and verification of requirements
- Engineering Review Board (ERB) representative for Chief Engineers Office to maintain mission assurance
- Review of technical presentations on launch vehicles and ground systems as part of the quorum and readiness polling
- Coordination and presentation of technical topics for launch systems for the Delta IV Product Line Chief Engineer
- Design, modification, testing, data analysis and post test data review of space launch vehicle and ground systems
- Evaluation of launch systems to characterize performance shifts from normal operation
- Console operation for space launch of numerous Delta IV launch vehicles
- Broad experience on components and systems in the following areas:

Cryogenics	Terminal Count Sequence Control
Hydraulics	Umbilical Retraction Systems
Pneumatics	Fixed Umbilical Tower Swing Arm Actuation
Hypergolics	Rocket Engine Launch Preparation (RS68 and RL10)
Environmental Control Systems	Rocket Nozzle Extension system (RL10)
Hazardous Gas Detection System	
- Responsible engineer for launch site vehicle “Out of Position Work” for removal and reinstallation of flight hardware
- Launch control room lead for all propulsion systems with total vehicle and ground system interface knowledge
- Day of launch control room failure-analysis and anomaly issue resolution
- Launch site modification of propulsion, umbilical and environmental control systems to accommodate special satellite requirements
- Leader of modification of launch site propulsion, umbilical and environmental control systems at Vandenberg Air Force Base to accommodate the first west coast launch of a Delta IV Heavy Launch Vehicle
- Supported Delta II operations as test engineer for pad, vehicle and RS27 rocket engine testing and processing

Appendix: Job Assignments

Ford Motor Company

- Powertrain development and program planning
- Evaluation of engine and transmission performance for drivability (stall, instability, unintended acceleration, lurch, rough idle, shift)
- Chassis systems development
- Anti-Lock Brake system integration and performance testing
- Break systems failure analysis and failure testing
- Development of steering and chassis systems
- Development of Engine Control Unit (ECU) software for engine and transmission control
- Research and development of Low Emission Vehicles (LEV), Ultra Low Emission Vehicles (ULEV) and Near Zero Emission Vehicles (NZEV)
- Development of natural gas powered vehicles

Owner Small Business – Engineering and Machining

- Design of components and sub-assemblies to meet customer specifications
- Component dimensional analysis
- Direct machining from CAD model
- Coordination with customer to resolve problems with customer-designed component parts
- Quality inspection of detailed airborne components digitally referenced back to CAD model with CMM technology
- Machining and engineering projects for military and commercial contracts, including the manufacture of airborne satellite components for Raytheon VIIRS program and Boeing 777 tooling
- Implemented inspection and quality control processes to meet ISO 9000 industry requirements

McDonnell Douglas Aircraft Company

- Manager of the MD 80 commercial airliner aircraft accident and incident resolution team
- Assessment of component failures and determination of root cause to establish interim and final corrective action for return to flight.
- Aircraft ice protection systems analysis
- Aircraft ice detection system design, build, test and operation
- Fuel systems design and testing
- Flight control systems design and failure analysis on jumbo commercial airliner (DC 10 / MD 11)
- Component design to meet functional requirements (DC 10 / MD 11)
- Aircraft cabin pressure control system design (MD 80)
- Analysis of jet engine performance to match aircraft interfaces on Pratt and Whitney JT8D-217C engine
- Design and flight test of experimental aircraft equipment for system certification

Appendix: Job Assignments

Vetronix Corporation

- Software development and testing of PC based software applications
- Management of team through phases of software development from concept definition to beta testing
- Coordination of product requirements and product acceptance with customer (General Motors)
- Coordination of software interface to supporting databases and other software packages

ASHA Corporation

- Research and Development of new traction control systems and components
- Design and test of electronically controlled and hydraulically actuated traction control systems for automobiles
- Build of prototype systems for bench testing and evaluations with customer
- Interpretation of Finite Element Analysis (FEA) data for stress on modified powertrain components
- Coordination with Ford and Saleen for implementation of traction control systems into production vehicles
- Automotive vehicle test driver

Hi Temp Insulation

- Development engineer and project lead for numerous aerospace thermal and radiation protection systems
- Design of thermal and radiation protection packages for aircraft and space applications
- Heat transfer and energy management analysis with NASA Sinda/Sinflow nodal analysis software
- Design of energy management and thermal insulation system for air borne laser system (design and analysis was proven to be correct in subsequent testing)
- Development and build of thermal multilayer insulation for the Space Shuttle
- Aircraft thermal and fire shield design, development and production (Boeing 757, F18, KC135)
- Testing of various radiation and thermal protection systems for space, aircraft and ground applications