

Dae Cain

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SUMMARY

Senior **fluid systems** engineer with 10 years developing **safety critical** mechanical and fluid hardware from **concept** through analysis, test, qualification, production support, and operation. Aerospace work covers cryogenic and high pressure systems, pumps, valves, pressure vessels, tubing, secondary structures, and propulsion adjacent hardware for demanding environments. Technical depth includes first principles sizing, 3D CAD with Creo, ANSYS structural and thermal analysis, fluid analysis, requirements and interface definition, trade studies, test planning, data review, and correlation of measured results with predictions. Leads cross disciplinary teams and subcontractors, coordinates procurement, manages risks, supports **material defect disposition**, and mentors junior engineers. Experience connects design decisions with verification, manufacturing, quality, and delivery commitments across complete hardware lifecycles. Brings practical judgment and disciplined technical ownership to high consequence aerospace programs.

EXPERIENCE

Senior Fluid Systems Engineer

February 2022 - Present

Cascade Aerospace Systems

Tacoma, WA

Owns cryogenic and high pressure **flight hardware** across design, analysis, qualification, **production support**, and operation. Provides technical direction for cross disciplinary work, controlled documentation, requirements, risks, test evidence, and junior engineer development.

- Led cryogenic pump and valve design reviews using Creo and ANSYS for qualification readiness
- Correlated **qualification** test data with fluid predictions, closing design **risks** before production release
- Defined requirements and interfaces for **pressure vessels, tubing**, and secondary flight structures
- Resolved material defect dispositions with quality and production teams during hardware delivery
- Mentored junior engineers through analysis reviews, test planning, and configuration controlled documentation

Lead Mechanical Engineer

June 2019 - January 2022

Orion Industrial Propulsion

Kent, WA

Directed mechanical and fluid hardware development for pumps, **valves**, pressure vessels, and tubing. Managed trade studies, subcontractor coordination, procurement inputs, schedules, risks, and technical decisions through test and delivery.

- Selected pump and valve architectures through first principles **trade studies** for demanding **propulsion** hardware
- Coordinated subcontractors and **procurement** teams around pressure vessel delivery risks and interface decisions
- Reviewed structural and **thermal analysis** before approving hardware for engineering test campaigns
- Converted test findings into corrective actions, updated requirements, and controlled design documentation
- Mentored engineers through design reviews, supplier communication, and **production support** decisions

Mechanical Systems Engineer

July 2017 - May 2019

Northwest Energy Machinery

Everett, WA

Developed high consequence rotating equipment and supporting **mechanical systems**, linking structural and thermal analysis with test correlation, interfaces, and operational reliability. Supported technical reviews and practical resolution of hardware risks.

- Analyzed rotating equipment loads with structural and thermal methods before prototype testing
- Correlated measured test results with analytical predictions, improving confidence in component decisions
- Mapped mechanical **interfaces** across assemblies, reducing late changes during integration reviews
- Supported risk reviews with documented evidence, clear owners, and actionable mitigation plans
- Prepared technical data packages for **design approval**, manufacturing release, and operational support

Mechanical Design Engineer

September 2016 - June 2017

Rainier Mechanical Technologies

Seattle, WA

Created mechanical designs and controlled documentation for components, drawings, sizing work, and test support. Built early career experience connecting 3D CAD decisions with analysis, fabrication, verification, and review discipline.

- Created **3D CAD** models and drawings for mechanical components using **Creo** design workflows
- Sized components from first principles, supporting fabrication and early engineering test preparation
- Updated configuration controlled drawings after review findings and manufacturing feedback
- Supported test setups by documenting hardware details, interfaces, and expected performance
- Participated in design reviews, capturing actions and closing documentation before release

PROJECTS

Cryogenic Flight Hardware Qualification 📅 2023

Safety critical hardware earns trust through evidence. Led qualification planning and data review for cryogenic components, connecting analysis predictions with measured performance and disciplined release decisions.

Pressure Vessel Interface Modernization 📅 2021

Good engineering begins with clear boundaries. Coordinated pressure vessel and tubing interfaces through trade studies, supplier input, risk review, and controlled documentation for smoother integration.

LEADERSHIP & AWARDS

- Technical leadership recognition for ownership of cryogenic and high pressure flight hardware programs.
- Peer recognition for mentoring engineers through analysis reviews, qualification testing, and design approval.
- ASME GDTP Technologist credential earned in 2019 for geometric dimensioning and tolerancing practice.

EDUCATION

M.S. Mechanical Engineering2020
University of Washington GPA: 0Seattle, WA
Coursework: Fluid mechanics, thermodynamics, structural mechanics, finite element analysis

B.S. Aerospace Engineering2016
University of Washington GPA: 0Seattle, WA
Coursework: Fluid mechanics, propulsion, materials science, aerospace structures

CERTIFICATIONS

- ASME GDTP Technologist 📅 2019
- Engineering Background Check Qualification 📅 2026

TECHNICAL SKILLS

- **Computer Aided Design:** Creo, 3D CAD, engineering drawings
- **Engineering Analysis:** ANSYS, structural analysis, thermal analysis
- **Fluid Systems:** Pumps, valves, tubing
- **Pressure Hardware:** Pressure vessels, high pressure systems, cryogenic systems
- **Requirements Engineering:** Requirements definition, interface definition, verification planning
- **Test Engineering:** Qualification testing, test planning, data review
- **Systems Engineering:** Trade studies, lifecycle management, technical reviews
- **Engineering Management:** Risk management, schedules, procurement coordination
- **Manufacturing Support:** Production support, material defect disposition, quality support
- **Design Governance:** Design approval, controlled documentation, engineering standards

SKILLS

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|-------------------------|--------------------|-----------------------|----------------------------|
| • Fluid systems | • Pumps | • Creo | • Fluid analysis |
| • Mechanical systems | • Valves | • ANSYS | • Requirements engineering |
| • Cryogenic systems | • Pressure vessels | • Structural analysis | • Interface definition |
| • High pressure systems | • Tubing | • Thermal analysis | |

PROFESSIONAL AFFILIATIONS

- Aerospace engineering community participant focused on fluid systems, propulsion hardware, and flight reliability.
- Mechanical engineering peer network contributor supporting practical design review, analysis, and mentoring discussions.

LANGUAGES

- English (Native)
- Spanish (Beginner)

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST