



ProTom International Holding Corporation

Job Description : Principal Mechanical Engineer

Summary:

- Under the direction of the Director of Engineering, the Principal Mechanical Engineer will be involved in, and lead aspects of the design, analysis, fabrication, installation, validation, verification, documentation, certification, support, upgrade, and maintenance of ProTom's proton therapy systems. Areas of concentration include engineering project leadership, large articulating mechanism design, optimization and analysis, assembly level structural Finite Element Analysis (FEA) static and dynamic, thermal cooling calculations (heat transfer FEA and CFD), large gear drive systems, large bearing systems, beamline component development, vacuum systems, and design for tight tolerance alignment of critical beamline components including large electromagnets.
- The Principal Mechanical Engineer is responsible for leading development teams for both in-house development projects and for leading outside development subcontractor teams.
- The Principal Mechanical Engineer must be well versed in documenting requirements in such a way that they can be partitioned into a mechanical system architecture with direct downward and upward traceability to design requirements such that they meet the ProTom Quality Management System (QMS) requirements.
- The Principal Mechanical Engineer will work with the Engineering and Physics teams to refine the mechanical system, subsystem, and component-level technical architecture needed to meet user, regulatory, and system-level requirements and to ensure that the top-level requirements are properly flowed into each subsystem and component-level specification as required by the FDA and ProTom QMS.
- The Principal Mechanical Engineer is responsible for development of modeling and simulations including facilities and cooling systems, and analysis used to validate the mechanical architecture that meets mechanical requirements.
- The Principal Mechanical Engineer is responsible for working with the rest of the ProTom organization to produce a set of test plans, test protocols, and support tooling which demonstrate that ProTom products meet all requirements, specifications, and regulations.
- The Principal Mechanical Engineer will be responsible to lead the team in execution of these test protocols and in documenting the test results in formal test reports.

Principal Responsibilities:

- Provide technical leadership in mechanical design, installation, verification and ongoing development of the *Radiance 330* components as directed by the Director of Engineering.
- Develop protocols and perform system and sub-system design verification and qualification testing.
- Prepare and document specifications; ensure designs meet ProTom requirements (coordinating with the Quality department).



- Lead the efforts in failure analysis of large mechanical systems, including accelerator and beam transport systems, rotating gantry structures, beam delivery, patient positioning subsystems that fall under the ProTom's area of responsibility.
- Assist in instructing personnel in safe use, handling and operation of therapy equipment.
- Lead the design and layout of radiation room facilities and provide input for equipment-building interface documents by liaising with outside Architectural design teams, and providing technical translation between the architectural and the mechanical 3D worlds.
- Lead and mentor junior engineers.

Qualifications:

- Bachelor of Science degree in Mechanical Engineering, MSME is preferred.
- Candidate will possess a minimum of 20 years mechanical engineering experience, experience working within the healthcare industry preferred.
- Expertise in the use of 3D modeling tools; SolidWorks experience is preferred but not required.
- Experience in the use of Finite Element Analysis (FEA) on large complex capital equipment structures is strongly preferred.
- Experience in thermal analysis tools - FEA, CFD.
- Experience in cooling calculations and piping networks analysis.
- Experience in the use of a PLM system.
- Expertise in the use of PCs for word processing, engineering calculations, data presentation,
- Experience in project management process and use of project management software is a plus.
- Candidate will have an ability to demonstratively show a development project completion of genuine mechanism designs from concept to productization.
- Candidate will have to be capable of leading a team of technical contributors through the development, analysis, documentation, fabrication, assembly, troubleshooting, testing, commissioning, and certification of a large complex piece of capital equipment.

Skills/Abilities/Competencies:

- Well-developed interpersonal and verbal communications skills for work with physicists, engineers, vendors, client administrators, etc.
- Ability to work in technical teams and to provide the technical leadership needed to keep these teams on track.
- Mechanical engineering knowledge related to the design of structures, mechanisms, and packaging.



- Ability to understand fundamental principles of complex electro-mechanical systems.
- Must have the technical curiosity and drive needed to develop a detailed knowledge of how all of the components of the system work together to provided their specified functions and performance attributes.
- Ability and desire to be an active participant in the hands-on build, integrate, test, and certification process for complex electro-mechanical systems.
- Ability to prepare and critique engineering documentation such as analyses, specifications, plans, reports, safety documentation and operation procedures.
- Must have an understanding of program management methods and process, be able to assemble cross-functional teams, schedule technical activities, and drive the team to complete assigned duties on time and within allocated budget.
- Must be an accomplished technical writer.
- Ability to write specifications, test plans, and protocols which verify and validate the ability of system and subsystem elements to meet their requirements and specifications.
- Demonstrated knowledge and compliance to safety standards called out by CE, ANSI, UL, and CSA.
- Demonstrated expertise in the application of lean design principles and processes.
- Demonstrated knowledge of reliability practices as related to mechanical design.
- Demonstrated knowledge of structural analysis methodologies and toolsets.
- Demonstrated knowledge of thermal analysis methodologies and toolsets.
- Ability to prepare engineering documentation such as analyses, reports, safety documentation and operation procedures .
- Demonstrated project leadership and project management experience.
- Capability to perform as a Mechanical Design Engineer within a cross-functional team of engineers.
- Well-developed verbal communications skills for work with physicists, engineers, vendors, client and administrators.
- Must have the ability to create impactful technical presentations and have the presence and maturity to deliver these presentations to in-house, customer, and partner audiences.
- Knowledge of code standards related to job responsibilities.

Working Conditions:

- Some amount of work is performed in and around an accelerator vault, with no natural light.
- Systems to be worked on include accelerator, beam line, gantries, patient positioners, imaging systems, beam delivery nozzles, associated subsystems and other electro-mechanical devices
- Some travel required.



Fiscal Responsibilities:

- Responsible for meeting budget and schedule commitments.
- Responsible for using ProTom resources in an efficient manner and identifying opportunities for savings

Training Requirement

- Complete training on, and stay current with, ProTom's QMS, PLM, PDM and all corporate policies, including specifically Human Resources and Finance policies, and the Employee Handbook.
- Radiation safety training.
- Construction jobsite safety training.

Salary and Benefits:

- Salary range: industry competitive.
- Company benefits package to include: health, dental, long-term disability, life insurance, 401k.
- Bonus potential.
- Participation in Company stock option program
- Holidays and paid time off.