

Sr. Mechanical Engineer

Under the direction of the Manager, Mechanical Engineering, the Senior Mechanical Engineer (SME) 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. At times the SME will be required to manage a subset of mechanical projects. Engineering skills and expertise will be applied to; large rotating mechanical structures and associated drive machinery, dynamically loaded structures, robotic positioning devices, precision mechanical components/assemblies, electronic packaging, hydraulic and pneumatic circuits, process and utility piping, vacuum systems, and proton beam control devices. The SME will participate in teams for both internal and external development projects. The SME 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.

Principal Responsibilities:

- Lead and perform mechanical/structural design, engineering, fabrication support, installation, verification, and ongoing development of the *Radiance 330* components as directed by the Manager of Mechanical Engineering.
- Prepare and document specifications; ensure designs meet ProTom requirements.
- Perform failure analysis of equipment malfunctions of the *Radiance 330* system, including accelerator and beam transport systems, rotating gantry structures, beam delivery, patient positioning, computer control and safety systems components that fall under ProTom's area of responsibility. Recommend and implement solutions.
- Assist in the design and lay out of radiation room facilities (machine placement and installation scale drawings are required in plan view and elevation; electrical and mechanical interface and control are drawn in schematic and sometimes 3D CAD detail).
- Share expertise and mentor staff.

Qualifications:

- Bachelor of Science degree in Mechanical Engineering; MSME degree is preferred.
- Candidate will possess a minimum of 15 years mechanical engineering experience. Experience working in highly regulated industries and on complex capital equipment desired both independently and within a cross-functional team of engineers.
- Candidate will have been responsible for a significant portion of the development, analysis, documentation, fabrication, assembly, troubleshooting, testing, commissioning, and certification of complex capital equipment.
- Proficient in the use of a 3D modeling software; SolidWorks experience is preferred. Expertise in the use of Finite Element Analysis (FEA) to evaluate large movable structures and machinery components. Additional experience in the use of CFD analysis tools is a plus.
- Experience with PDM systems; SolidWorks EPDM is preferred.
- Proficiency with principles and practices of mechanical design, structural design, mechanisms, hydraulics, pneumatics, and electronic packaging. Familiarity with facility mechanical equipment is a plus.
- Experience in design for high cycle fatigue and vibration management. Familiarity with seismic analysis a plus.
- Experience with engineering vacuum systems is a plus.
- Experience in the design and test of precision motion control systems.
- Experience in the selection and specification of materials.

- Experience in conducting trade-off studies which consider cost, manufacturability, reliability, function, safety, and implementation.
- Demonstrated knowledge of field alignment practices of heavy machinery and inspection metrology.
- Demonstrated knowledge of most common shop processes including machining, gear hobbing, forming, welding, casting, and application of protective coatings. Knowledge of plastic molding is a plus.
- Demonstrated knowledge in the use of technical regulatory codes and standards.

Skills/Abilities/Competencies:

- Ability to design, size, and/or select components for heavy and light duty mechanical power transmission systems comprised elements such as servo motors, actuators, open gears, speed reducers, radial and linear bearings, shafts, shafting, translation screws, couplings, encoders, limit switches, proximity sensors, load and torque cells.
- Ability to design and analyze movable and static structures, optimizing for characteristics such as strength, rigidity, weight, durability, and transportability. Design of welded and bolted slip critical connections. Ability to design anchorage and specify foundation requirements.
- Ability to design and work with assemblies requiring precise alignment of critical beamline components including large electromagnets.
- Ability to design precision mechanisms such as magnet positioning devices, beam stops, translation slides, and sub-assemblies for patient specific device extensions.
- Capability to select materials based on mechanical properties, environmental, compatibility, service demands, and manufacturing considerations. Adept at specifying process treatments, finishes, coatings, and lubricants.
- Ability to design vacuum beam line systems. Competent to define functional requirements of the system, engineer chambers, select; pumps, fittings, and ancillary equipment. Ability to fully document such systems.
- Ability to engineer and implement thermal management solutions for a variety of electronic packaging and equipment applications.
- Strong design and drafting skills are required with the ability to produce detail fabrication, assembly, and specification control drawings. Must be well versed in the use of ANSI Y14.5 GD&T. Experience with generating and managing BOMs.
- 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.
- 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 engineering documentation such as analyses, reports, safety documentation and operation procedures.
- Knowledge of code standards related to job responsibilities herein delineated. Awareness of equipment related safety standards defined in CE, ANSI, UL, and OSHA.
- Well-developed interpersonal and verbal communications skills for work with physicists, engineers, vendors, client administrators, etc.

Mental/Physical Skills:

- Strong sense of ownership and integrity.
- Understanding of and ability to work within the ‘team’ concept on products which have a profound effect on the lives of people and their families.
- Demonstrable ingenuity in the design, construction and operation of highly technical apparatus.

Working Conditions:

- Office environment for the majority of time
- A Significant 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

- 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 Quality Management System 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
- Bonus potential
- Participation in Company stock option program
- Holidays and paid time off

To Apply: If you meet the required skills and qualifications and want to apply for this position, please send your cover letter and resume in PDF format to Jobs@ProTomInternational.com. Local candidates in the Boston, MA area only, please. ProTom International conducts pre-employment background screenings, and is proud to be an Equal Opportunity Employer. M/F/D/V

