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DIVISION: Nuclear Operations and Advanced Manufacturing

DEPARTMENT: Reactor Operations

VACANCY: **Nuclear Safety Specialist**

SALARY BAND: Hay Level 17/D2

REFERENCE NO: **NUCSAFESPEC01**

NECSA is a State-Owned Company (SOC) in terms of the Companies Act and derives its mandate from the Nuclear Energy Act of 1999 responsible for undertaking and promoting research and development in the field of nuclear energy and radiation sciences and for the commercial exploitation of nuclear technology. NECSA engages in commercial business mainly through its two 100% owned commercial subsidiaries NTP Radioisotopes (Pty) Ltd. and Pelchem (Pty) Ltd. NTP is responsible for a range of radiation-based products and services for health care, life sciences and industry, whilst Pelchem supplies fluorine and fluorine-based products. Further information on NECSA can be obtained from the website www.neesa.co.za

Job Profile:

To execute the responsibilities of the NE section related to the SAFARI-1 SAR, OTS and to maintain and implement an appropriate process for the safety of experiments in and around the SAFARI-1 reactor. Additionally, to perform analyses and provide inputs for operational, maintenance and development projects, to provide expertise for the solution of nuclear safety related challenges unique to SAFARI-1, and to provide expert assistance with core management, fuel manufacturing deviations and safeguards.

Key Performance Areas:

- **SAR Maintenance and Updates:**
- Document Management: Diligently maintain and update the Safety Analysis Report (SAR) for SAFARI-1, ensuring that it accurately reflects current operations, safety analyses, and systems descriptions.
- Procedure Compliance: Adhere to SAFARI-1 and Safety, Health, Environment, and Quality (SHEQ) procedures in the management of the SAR, guaranteeing alignment with organizational safety culture and internal controls.
- Regulatory Adherence: Ensure the SAR is consistent with the requirements of the National Nuclear Regulator (NNR) NIL-02 license and conforms to the standards and guidelines set forth by the International Atomic Energy Agency (IAEA).
- **OTS Maintenance and Updates:**

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- Operational Transparency: Ensure that the Operating Technical Specifications (OTS) document is kept current, reflecting any changes in operational limits and conditions, safety limits, and administrative controls.
- Standards Compliance: Align updates of the OTS with SAFARI-1 and SHEQ procedures, the NIL-02 license stipulations, and IAEA standards, maintaining a high standard of operational safety and compliance.
- Documentation Integrity: Regularly review and verify the accuracy and completeness of the OTS, ensuring that it serves as a reliable guide for reactor operators and supports safe reactor operations.
- **Continuous Improvement:**
- Safety Assessment Development: Actively participate in the development of improved practices for deterministic and probabilistic safety assessments, enhancing the facility's safety profile.
- Implementation of Best Practices: Assist with the practical implementation of these best practices, ensuring that they are integrated into the daily operations and safety culture of SAFARI-1.
- Risk Management: Contribute to a proactive risk management approach by applying systematic safety assessment techniques to identify and mitigate potential risks in reactor operations.
- **Process Maintenance for Safety of Experiments:**
- Process Updates: Regularly maintain and update the processes and procedures related to the Safety of Experiments for SAFARI-1, ensuring they reflect current practices and any new regulatory or technical developments.
- Process Optimization: Continuously seek to improve the Safety of Experiments process, ensuring that it is efficient, user-friendly, and effective in identifying and mitigating risks associated with experimental activities.
- Documentation and Compliance: Ensure that all process documentation is clear, up-to-date, and in compliance with SAFARI-1 guidelines and SHEQ (Safety, Health, Environment, and Quality) requirements.
- Safety Analyses for Experiments:

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- **Safety Evaluations:** Coordinate and execute thorough safety analyses for experiments to be conducted at SAFARI-1, ensuring all potential hazards are identified and mitigated.
- **Analytical Rigor:** Apply rigorous analytical methods in line with SAFARI-1 and SHEQ standards to assess the safety of experimental setups, procedures, and materials.
- **Cross-Functional Collaboration:** Work closely with experimental teams to understand their objectives and ensure that safety considerations are integrated from the design phase through to the execution of experiments.
- **Best Practices in Safety of Experiments:**
 - **Best Practices Development:** Actively engage in developing best practices for ensuring the safety of experiments, drawing on industry standards, research findings, and operational experience.
 - **Implementation Strategies:** Facilitate the implementation of these best practices within SAFARI-1, providing guidance and support to experimental teams and management.
 - **Continuous Learning:** Promote a culture of continuous learning and improvement in experimental safety by staying informed of advancements in safety science and incorporating innovative approaches into SAFARI-1's practices.
- **Problem Solving:**
 - **Expertise Provision:** Provide specialized knowledge in nuclear safety, engineering, and thermal hydraulics to identify and resolve technical and procedural issues that may impact reactor safety.
 - **Solution Development:** Develop effective solutions to complex problems by applying best practices, industry standards, and innovative thinking in the context of nuclear safety.
 - **Interdisciplinary Collaboration:** Collaborate with cross-functional teams to address safety-related challenges, ensuring a holistic approach to problem-solving that includes operational, maintenance, and safety perspectives.
- **Design Analysis:**
 - **Scientific and Engineering Evaluation:** Employ scientific expertise and advanced computational codes to rigorously analyze reactor designs, modifications, and upgrades for safety and efficiency.

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- **Compliance Verification:** Verify that design elements comply with all relevant safety regulations, standards, and best practices, both domestically and in accordance with international guidelines such as those from the IAEA.
- **Risk Assessment:** Conduct risk assessments as part of the design analysis to identify potential safety issues and propose modifications to mitigate identified risks.
- **Manufacturing Deviations:**
- **Technical Assessment:** Offer technical expertise to evaluate manufacturing deviations or non-conformances of fuel products, assessing their impact on reactor safety.
- **Corrective Actions:** Provide recommendations for corrective actions or compensatory measures to address manufacturing deviations, ensuring that the safety margin of the reactor is maintained.
- **Quality Assurance:** Work closely with manufacturing and quality assurance teams to ensure that all components meet stringent safety criteria before being used in the reactor core.
- **Core Planning:**
- **Strategic Assistance:** Offer expertise in reactor physics and engineering to aid in the planning of the reactor core configuration, ensuring a balance between operational efficiency and stringent safety requirements.
- **Compliance Assurance:** Help to ensure that core planning and operations comply with all relevant safety regulations and standards, including those set by the National Nuclear Regulator (NNR) and international bodies such as the International Atomic Energy Agency (IAEA).
- **Optimization of Reactor Performance:** Work on optimizing the core for various objectives such as fuel economy, power distribution, and thermal limits, while maintaining a strong safety profile.
- **Safeguards:**
- **Implementation Support:** Provide support for the implementation and maintenance of nuclear Safeguards at SAFARI-1, ensuring that all protocols and procedures for nuclear material accountancy and control are up to date and in line with IAEA recommendations and requirements.

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- Training and Awareness: Assist in the training of SAFARI-1 personnel in Safeguards-related activities to promote a culture of compliance and awareness of the importance of non-proliferation.
- Continuous Monitoring: Contribute to the continuous monitoring and improvement of Safeguard measures, including the use of surveillance systems and the application of physical and administrative barriers to prevent the diversion of nuclear materials.
- Safety Training: Engage in regular safety trainings and contribute to the training of staff.
- BBS Observations: Perform monthly safety observations to identify and encourage safe workplace behaviors.
- Safety Initiatives: Actively participate in and promote safety culture through continuous improvement efforts and open communication on safety matters.

JOB REQUIREMENTS

KEY KNOWLEDGE & SKILLS

- Knowledge of reactor operation principles (heat transfer, fluid flow, reactor physics, nuclear physics, radiation shielding, reactor protection systems).
- Understanding of nuclear licensing requirements
- safety analysis techniques
- NNR requirements
- Proficiency in general and specialized software (e.g., RELAP, MCNP).

COMPETENCIES

- Analytical thinking and attention to detail
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- Anticipating and managing change
- Focus and alertness
- Holistic / big picture thinking
- Creativity / innovation
- Judgement and decision-making
- Problem solving
- Memory
- Tolerance of ambiguity
- Action orientation and decisiveness
- Adaptability / flexibility
- Excellence / quality orientation

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- Rule orientation

Qualifications and Experience:

Education:

- MSc or M.Eng preferably with Nuclear Engineering

Experience:

- 5+ years' experience in nuclear safety analysis, core design, fuel design and safeguards

Closing date: **November 2025.**

CONTACT PERSON

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Important: Necsa Group is committed to Employment Equity when recruiting. Therefore, priority will be given to African Females, African Males, and people with disabilities, in support of achieving our Employment Equity targets.

GENERAL:

Should you not hear from us within 30 days of the closing date, please consider your application unsuccessful.