

Dream-Team at UNEP Solves Aging Issue of Research Reactors

UNEP Leads the Nation in Application of Nuclear Power Industry Repair Methodology to Aging Research Reactors.

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Many of the research reactors in the country are experiencing issues related to aging mechanical and electrical components. While these issues do not affect safety, due to the "inherently safe" design of research reactors, their unplanned repairs do create scheduling issues that make conducting student training and research activities challenging.

The TRIGA reactor at UNEP, which first came online in 1975, is not immune to these types of concerns.



Recently, the water level detection circuitry that protects the core in event of a loss of water level had been sending additional protective signals that were not necessary for the current condition. These "spurious" signals would place the reactor in a shutdown (safe) condition, even if the water level was adequate for operations, thus making training and research difficult to accomplish. This was a

long standing issue at UNEP, with a history of occurrence dating back at least two decades.

Historically, these types of electrical issues could take upwards of several weeks to trouble shoot and repair, but when the issue interrupted training during a July 2013 reactor run, the new "Dream Team" at UNEP immediately went to work.

This Dream Team, consisted of the current Reactor Supervisor, Greg Moffitt, two University of Utah Students, Matthew Lund and Richard Sisson, and two newcomers to UNEP, Jessica Engler and Ryan Schow, both of whom have recently transitioned to UNEP from commercial nuclear power plants.

Ryan and Jessica coordinated with Greg to apply their knowledge of the current trouble shooting and repair framework utilized by the Nuclear Power Industry to facilitate rapid repairs and maintain high levels of unit availability. This methodical approach allowed the team to leverage Matthew and Richard's instrumentation and electronics repair knowledge to conduct the repair in record time.

During the repair effort, it was determined that the corrosion of the wiring near the level detector, the type of which is a very common concern for research reactors of this age, was the most likely cause.

While the corrosion concern is certainly not unique to UNEP, what was remarkable was the speed and efficiency of the repair. Under the guidance of the UNEP Staff, Matthew and Richard replaced the affected components, and cleaned and repaired the corroded electrical connections. Immediately following the repair the UNEP staff was able to perform the necessary testing to place the water level detection system back online. This teamwork and application of Industry Methodology to a research setting appears to be the first of its kind in the nation. The speed and efficiency with which the repair was accomplished, as well as the intimate knowledge of power industry best practices, and effective leveraging of student technical knowledge, places UNEP ahead of the curve in proactively managing reactor operations and repairs.

UNEP "Dream Team" Members



Greg Moffitt

Acting Reactor Supervisor/ M.S. Nuclear Engineering student

Research Focus: Modeling Compact Neutron Sources

Experience: Senior Reactor Operator and acting Reactor Supervisor, UNEP



Ryan Schow

Reactor Supervisor Trainee/ Ph.D Nuclear Engineering Student

Research Focus: Nuclear Forensics

Experience: Senior Reactor Operator (SRO), D.C. Cook Nuclear Power Station /, U.S. Navy Nuclear Submarine Officer



Jessica Engler

Reactor Supervisor Trainee/ M.S. Nuclear Engineering Student

Research Focus: Effects Radon Gas Exposure on Cancer Development

Experience: Catawba Nuclear Station SRO instructor, U.S. Navy Reactor Operator/Electronic Technician



Matthew Lund

M.S. Nuclear Engineering Student (Forensics Track)

Research Focus: 3D Modeling of Radiation Exposure in Space Using Geant4

Experience: Physics / Electronics Instructor, Factory Trained Low Voltage Technician for Electronic Theater Controls (Major Theatrical Lighting Manufacturer)



Richard Sisson

B.S. Mechanical Engineering Student with Nuclear Engineering Minor

Research Focus: Nuclear forensics and Robotics

Experience: Non-destructive testing of pipelines and equipment for Petro-Gas Industry, Department of Defense contractor specializing in field operations and repair of communications, instrumentation, as well as ground and aerial sensor platforms.
