



RCNET

**Regional Center for
Nuclear Education and Training**

**Year 5
Midyear Progress Report
December 2015**





Year Five Midyear Progress Report December 2015

Prepared for

Regional Center for Nuclear Education & Training
Headquartered at Indian River State College
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Executive Summary

The Regional Center for Nuclear Education & Training (RCNET) was established to make sure the demand for skilled nuclear technicians is met in a standardized and systematic way.

This is year five for RCNET, which is a one year no-cost extension of their NSF grant. During this year, RCNET has been completing its original funding goals while also planning its expansion into other nuclear fields in accordance with its NSF grant renewal plan. The purpose of midyear reports in previous years has been to provide formative evaluation, informing RCNET's management team for its decision making during the second half of the year. This report is no different in that it is formative in nature, especially in consideration to allocating the human resources for the remaining half of the year. It is also a progress report, including RCNET's Subaward Recipient's Midyear Progress Report and RCNET's Curriculum Alignment Professional Development Event.

RCNET this year is in a situation where it must plan and be prepared for two entirely different situations. The NSF grant funding renewal/expansion has been filed. If the grant is not renewed then the work to date must be preserved and accessible. If the grant is renewed, then all parties must be ready to jump onboard immediately in efforts to expand to the National Center for Nuclear Education and Training and be ready to work with new partners in new nuclear fields.

Working with a favorable NSF grant funding decision in mind, RCNET has done a great job in gaining support from both academic and industry partners in the new expansion fields of nuclear environmental management, nuclear manufacturing components and processes, and nuclear life and plant science, to complement their work to date in nuclear energy and nuclear fundamentals. In November, RCNET held a professional development event at INPO which brought together 22 professionals from 15 different academic partners to help colleges without nuclear energy programs launch new programs and colleges with nuclear energy programs expand into other nuclear disciplines.

RCNET marketing announcement for their November Professional Development event on Curriculum Alignment (for the new nuclear expansion fields):

“Why Attend?

Did you know by 2030 there will over 65,000 high-paying nuclear job openings in fields such as nuclear energy, nuclear environmental management, nuclear life and plant science, and nuclear processes in manufacturing? These nuclear industries account for more than 2.6M jobs and \$120B toward the United States Gross Domestic Product.”

Introduction

Regional Center for Nuclear Education and Training (RCNET) Background

In August of 2011, the National Science Foundation (NSF) established the Regional Center for Nuclear Education and Training (RCNET) to address the nuclear industry's workforce demands in a unified and systematic way.

RCNET is located at Indian River State College (IRSC) in Fort Pierce, FL and is a consortium of 46 colleges and universities, 35 industry partners, and multiple agency and other partners. (See Appendix A for a list of these partners)

RCNET's primary focus is on two-year college training and it involves partnerships between academic institutions and employers to promote improvement in the education of nuclear technicians at the undergraduate and secondary school levels. RCNET is also responsible for curriculum development, professional development of college faculty and secondary school teachers, career pathways to two-year colleges from secondary schools and from two-year colleges to four-year institutions, and providing standardized quality resources to schools across the region.

External Evaluator's Background

Benjamin Reid, Principle Consultant of Mejetal Inc. (a research and evaluation company), is leading the external evaluation of RCNET. Benjamin has implemented and evaluated marketing campaigns for Fortune 500 companies, served as a center director and adjunct faculty at California State University, and program manager for the Banner Center for Energy at IRSC. Evaluation became important to him while preparing investment reports and procurement notices for the Dept. of Commerce at the American Embassy in London. Benjamin earned Bachelor Degrees from the University of Glamorgan (UK) and UCF and a Masters of International Business from the University of Florida.

"Due to growth, an aging workforce, international competition, and natural attrition, the nuclear industry in the United States is experiencing unprecedented workforce demands. (...) Current training platforms are not scaled to meet this need which puts both the industry and our nation at risk."

-RCNET

Continual learning and development is paramount in this profession, therefore Benjamin Reid and Mejetal Inc. work by Daniel Stuffelbeam's doctrine: "The most important purpose of evaluation is not to prove, but to improve."

RCNET's Major Goals

The mission of RCNET is to make sure the demand for skilled nuclear technicians is met in a unified, systematic way. The 8 key goals of RCNET over the first 4 years of the grant were:

1. Provide complete turnkey standardized teaching and assessment material, and student resources for nuclear energy, environmental management, plant & life science, and manufacturing fields.
2. Develop, categorize, and maintain a learning repository for nuclear curriculum.
3. Provide professional development for secondary, post-secondary, and industry trainers.
4. Provide access and lesson plans to embed unique training systems in partner programs.
5. Provide academic pathways and professional development for students and technicians.
6. Be a central point of contact for career assistance and develop career pathways.
7. Provide materials and assistance in secondary outreach and diversity recruitment.
8. Promote nuclear technology and nuclear careers.

Due to RCNET's maturity, successful incorporation of best practices, and experience, several of the above goals do not take as much effort to maintain; such as the learning repository, and career and academic pathway efforts. Therefore, RCNET has been able to add 2 additional goals going forward.

9. Expansion into other nuclear disciplines.
10. Increase the breadth of ATE technicians.

"In addition, focus placed on incorporating unique training systems in the college classroom is transitioning into placing additional focus incorporating emerging technologies into college and industry training programs. It was determined through student, graduate, and industry surveys that increasing the skill set of nuclear technicians in emerging fields would train them well for the future. Already over the life of RCNET, the industry has seen the transition from analog to digital controls and the recent incorporation of simulations, virtual and augmented reality, into training and work environments. It is predicted that both unmanned systems and 3D printing will be industry standards in the near future and this transition will help RCNET graduates stay ahead of the curve."

-RCNET

Subaward Recipient's Midyear Progress Report

**RC-NET Grant Deliverables
Chattanooga State Community College
Scope of Work 2015-2016**

Chattanooga State Community College commits to the following tasks and deliverables in Year 5 (No-Cost Extension) of the RC-NET Project:

Curriculum Deliverables

1. Revise material for QA/QC which was previously placed in the dropbox.
2. Continue to lead a QA/QC curriculum committee composed of representatives from a majority of schools and their industry partners offering QA/QC training.
**Industry Advisory Board Fall Meeting:
Discussed possible internships and embedded certificates
ABET certification of the QA/QC program in 2016**
3. Develop a Quality Auditor Certificate specific to work an audit process.
**Embedded certificates for Fall 2016 include:
QA/QC Internal Auditor Certificate
QA/QC Inspection Certificate
QA/QC Quality Systems Certificate**

Professional Development Deliverables

1. Host two on ground professional development training promoting QA/QC needed skills .**Spring 2016**
 - a. Recruit from all colleges offering QA/QC training and industry.
 - b. Document attendance and secondary impact of training (who attended and who do they represent).
2. Host a two-day workshop for secondary school personnel. **July 2016**
 - a. Document attendance and secondary impact of training (who attended and who do they represent).
 - b. Follow up survey will be used to tract impact of training.
 - c. Send faculty and staff to professional development.
 - d. Annual partner meeting. **Samantha Travis & Terry Newman – INPO RCNET Curriculum Meeting Nov 2015**
 - e. Regional training sessions. **Spring 2016**
 - f. National conferences. **Spring 2016**
3. Host a one-day Quality Summit for industry partners. **June 2016**

Marketing and Outreach Deliverables

1. Provide outreach sessions with secondary schools systems with attendance being documented.
**In process of setting dates to speak to STEM classes at numerous schools.
Attended College Fair in October and Career Crunch in November.**

Career & Academic Pipeline Deliverables

1. Arrange for NUCP students to attend: **April 2016**
 - a. RCNET's Career and Academic Pathways presentation or similar.
 - b. RCNET's Introduction & Job Placement Assistance presentation or similar.
 - c. RCNET's Resume, Cover Letter and Interview Skills presentations or similar.
 - d. Document attendance.

RC-NET Grant Deliverables
Chattanooga State Community College
Scope of Work 2014-2015
[updated since end of year 4 report]

Curriculum Deliverables

1. Create a detailed outline for the requirements needed to prepare a student to become a civil/construction inspector with a list of training materials.

Deliverable still in process due to prospect for position took employment elsewhere.

Completed

2. Revise material for QA/QC which was previously placed in the dropbox.
Additional classes added to curriculum: Quality Auditing; Root Cause Analysis and Corrective/Preventive Action; Continual Improvement and Human Performance Measures
3. Develop a body of knowledge prepare students to sit for the Certified Quality Auditor exam.
Curriculum includes the development, organization and administration of an audit program; the mechanics of an individual audit; audit objectives; and auditing techniques required by ASME NQA-1 Quality Assurance Requirements for Nuclear Facility Applications and ASQ Certified Quality Auditor (CQA) Body of Knowledge (BOK).
4. Continue to lead a QA/QC curriculum committee composed of representatives from a majority of schools and their industry partners offering QA/QC training.
Quality Summit July 2015
5. Create a comprehensive list of colleges which offer QA/QC programs of study.
A list has been created and sent to RCNET.

Professional Development Deliverables

1. Host two on ground professional development training promoting QA/QC needed skills .
 - a. Recruit from all colleges offering QA/QC training and industry.
 - b. Document attendance and secondary impact of training (who attended and who do they represent).

Project Quality Assurance, April 1, 2015. Workshop on Quality in Project Management. Total number in attendance were 25 students and two Chattanooga State teachers. Handouts of powerpoint presentation were given for future reference and a survey was taken on knowledge before and after workshop, strength of the workshop, and any suggestions to improve the workshop.

Analyzer Training -May 27, 2015. Eleven attendees; teachers and professionals.

Subaward's Suggestions for RCNET

A job board for students to apply

Gonuke.org has a resume bank and industry bank. However, it may be more beneficial for students to see jobs that are available. Possibly, a list of industries who hire Nuclear Power, Radiation Protection, and/or QA/QC graduates. Any internships or part time on the job training would be very beneficial to QA/QC students. Also, to have feedback, numbers, etc on how job placement is with the tool that is in place now.

Subaward's Accomplishments through RCNET

Professional Developments

Because of RCNET we have been able to provide our students and the community with great professional developments. Two of our best have been a guest speaker on counterfeit parts and our "Radiation & You" Seminar where students and the public were asked to attend to learn more about radiation. For the past two years we have held a summer teacher workshop to educate teachers and counselors on jobs in the nuclear industry. This has proven to be a great networking tool to reach out to STEM teachers for Samantha Travis (RCNET Technical Specialist) to schedule activities in the classroom.

Evaluator's Notes on Subaward Recipient

Chattanooga State Community College has done a fine job in regards to the aspects relevant to evaluations, notably being timely and organized in data collection and communication. They were also a major contributor during RCNET's November Curriculum Alignment Professional Development event, helping to develop curriculum tracks for the expansion fields.

"Being thoroughly familiar with all of RCNET's activities, I can say that job announcements and lists of industries and companies that hire graduates are available by RCNET. It may be most beneficial for RCNET to host an updated professional development webinar in the Spring for partner programs and students to become more familiar with accessing RCNET's career resources."

-Evaluator

Curriculum Development Professional Development Event

RCNET's Curriculum Alignment Professional Development for Nuclear Trainers & Educators

Two-Day Professional Development for Nuclear Trainers & Educators, Funded by NSF!

This meeting is designed to help colleges without nuclear energy programs launch new programs and colleges with nuclear energy programs expand into other nuclear disciplines.

Why Attend?

Did you know by 2030 there will be over 65,000 high-paying nuclear job openings in fields such as nuclear energy, nuclear environmental management, nuclear life and plant science, and nuclear processes in manufacturing? These nuclear industries account for more than 2.6M jobs and \$120B toward the United States Gross Domestic Product.

Join RCNET, nuclear agencies, and a spectrum of industry partners representing nuclear energy, nuclear environmental management, nuclear life & plant sciences, and nuclear processes in manufacturing November 19-20 @ INPO in Atlanta, GA to help align nuclear curriculum and find out how to expand into these growing fields.

Stipends available to attend! RCNET will pay \$2,000 per organization, directly to the participants attending.

Team Orientation Call

RCNET will host a one hour call with your college the week of Nov 2-6, 2015. The final date, time, and dial-in information will be emailed to you prior to the call.

At left is RCNET's marketing announcement for their Curriculum Alignment Professional Development event. It encompasses the key messages and fields of focus for the proposed grant expansion.

The PD event was a success with 22 Nuclear Trainers and Educators attending from 15 academic institutions. Their participation enabled a draft Nuclear Specializations/Tracts curriculum for Nuclear Environmental Remediation, a nearly complete draft for Manufacturing in Nuclear - Components & Nuclear Processes (both drafts in the following pages). And ample notes were taken from the discussions to allow the ground work to begin in the third nuclear field: Nuclear Life and Plant Science.

Nuclear Specializations/Tracts

Nuclear Environmental Remediation

Class 1 – Introduction to Environmental Regulations

Objectives

- a. Federal/State Laws & Regulations
- b. OSHA
- c. EPA
- d. NRC
- e. HAZMAT
- f. Labs/Activities
- g. Case Studies
 - i. Presentations
 - ii. Discussion Forums

Class 2 – Nuclear Materials Processing

Objectives

- a. Chemical Processes
- b. Waste Tank
- c. Gasification
- d. Systems & Processes
- e. Labs/Activities
 - i. Site Visits/Tours
 - ii. Simulations

Class 3 – Deactivating & Decommissioning

Strategies

Objectives

- a. Transportations & Shipping
- b. Decontamination
- c. Deactivate
- d. Site Inspection & Monitoring
- e. Demolition Techniques
- f. Project Management
- g. Waste Monitoring
- h. Labs/Activities

**Apprenticeships/
Internships to be
developed with partners
that focus on objectives.**

Class 4 – Radioactive Waste Management

Objectives

- a. Waste Character
- b. Toxicology
- c. Geology
- d. Hydrology
- e. Nuclear Safety
- f. Risk Management
- g. Waste Handling
- h. Site Monitoring
- i. Labs/Activities

Class 5 – Capstone/Special Project

Objectives

- a. New Technologies (Robotics, 3D printing, etc.)
- b. Case Study
- c. Soft Skills
- d. Team Work
- e. Labs/Activities

**Radwaste Shipping
Certification to be
considered as an add-on.**

Nuclear Specializations/Tracts

Manufacturing in Nuclear – Components & Nuclear Processes

Class 1 – Introduction to Nuclear Processes in Manufacturing

Objectives

- a. Federal/State Laws & Regulations
- b. Nuclear Components – QA/QC
- c. Nuclear Processes

Class 2 – Industrial Practices

Objectives

- a. Nuclear Power Practices
- b. Terminology
- c. Safety
- d. Soft skills

Class 3 – Instrumentation & Gauging

Objectives

- a. Pre-req needed - Metrology & Calibration
- b. Use of measuring devices that use radiation
- c. Sterilization of instruments used in hospitals, etc.
- d. Irradiation in the food industry
- e. Tours

Class 4 – 3-D Printing & 3-D Scanning

Objectives

- a. New Technologies (3D printing, 3D scanning etc.)
- b. QA/QC (re-engineering, re-manufacturing)
- c. Case Study
- d. Labs/Activities

Apprenticeships/Internships to be developed with partners that focus on objectives.

Note: it was discussed that these classes be combined or added to classes RCNET currently has in place. Below is the list of classes that could be used to create a program. These classes are currently in place in one of RCNET's established programs. (QA/QC, NDT, Engineering Systems Management)

- Codes, Standards & Regulations
- Metrology & Calibration
- Intro to NDT & QA/QC
- Root Cause Analysis & Preventive/Corrective Actions
- Blue Print Reading & Analysis
- Power Plant Construction
- Welding Principles
- Project Design & Management
- Electrical Fundamentals
- Fundamentals of Metallurgy

Evaluation Focuses Through End of Year Five

Following the success of the Curriculum Alignment Professional Development event for Nuclear Trainers and Educators, the evaluation service in January 2016 will seek to close the gap in the curriculum development for the remaining field of Nuclear Plant and Life Science. This will be accomplished by following the model and process for outlining courses as they would fit into academic partners' programs. Industry partners will be consulted for their input of needs and best training practices, and academic partners will be consulted in the effort to work existing lessons and courses into a new nuclear track offering.

At the end of this year's grant extension, a formal, summative evaluation of RCNET will be undertaken for the sake of the National Science Foundation and the numerous academic and industry partners and stakeholders.

Prior to that final year five report, formative evaluation assistance will be given towards RCNET's annual professional development event.

Given the possibility of RCNET's grant funding expansion not being accepted by the National Science Foundation come summer for continuation in the fall, the Evaluator will also work with RCNET's management in order to ensure all documents and work are accessible by NSF and RCNET's stakeholders at large as they like in future years.

Given the possibility of RCNET's grant funding expansion being accepted by the NSF and the center continuing and expanding come Fall 2016, the Evaluator will work with RCNET's management to be prepared to work with their academic and industry partners in all matters related to evaluation, including data collection responsibilities and procedures, and knowledge for making the most out of the data and evaluations.

The end of RCNET year five is an interesting time, as this is a grant extension period with the grant expansion decision to be delivered in Summer of 2016 for continuation in Fall 2016. The Evaluator and RCNET's management must be prepared for either decision. If the grant is not renewed then the work to date must be preserved and accessible. If the grant is renewed, then all parties must be ready to jump onboard immediately in efforts to expand to the National Center for Nuclear Education and Training and be ready to work with new partners in new nuclear fields.

References

- American Evaluation Association. (2004). Guiding Principles for Evaluators. Last retrieved from <http://www.eval.org/p/cm/ld/fid=51> on November 15, 2015.
- Burkhardt, J., Knestis, K., Tyson, W., & Wingate, L. (2014, December). *Evaluation and research in the ATE program*.
- Burkhardt, J., Lesiecki, M., Martens, K., & Wingate, L. (2013, May). *The nuts and bolts of ATE evaluation reporting*.
- Chen, H-t. (2004). Practical Program Evaluation: Assessing and Improving Planning, Implementation, and Effectiveness. Thousand Oaks, CA: Sage Publications.
- EvaluATE. (2010). Establishing Claims and Providing Evidence of Effectiveness of ATE Grants. Last retrieved from: <http://evalu-ate.net/downloads/Establishing.pdf> on July 15, 2013.
- Frechtling, J., and Sharp, L. (1997). The User-Friendly Handbook for Mixed-Method Evaluations. NSF 97-153. Arlington, VA: NSF.
- Frechtling, J. (2010) The 2010 User-Friendly Handbook for Project Evaluation. NSF 02-057. Arlington, VA: NSF.
- Herrell, J. M., & Straw, R. B. (2002). Conducting Multiple Site Evaluations in Real-World Settings. New Directions for Evaluation, No. 94, San Francisco, CA: Jossey-Bass.
- Joint Committee on the Standards for Educational Evaluation. (2010). The Program Evaluation Standards. 3rd Ed. Thousand Oaks, CA: Sage Publications.
- Nuclear Energy Institute. (2013). Nuclear Uniform Curriculum Program 2013 Survey. PDF
- Patton, M.Q. (2008). Utilization-Focused Evaluation. 4th Ed. Thousand Oaks, CA: Sage Publications.
- Stufflebeam, Daniel L., and Shinkfield, Anthony J. (2007). Evaluation Theory, Models, and Applications. San Francisco, CA. Josey-Bass.
- W.K. Kellogg Foundation. (2004). Evaluation Handbook. Battle Creek, MI: Last retrieved from: <http://www.wkkf.org/knowledge-center/resources/2010> on November 15, 2015.
- Wingate, Lori A. (2013). Logic Model Template for ATE Projects and Centers. Last retrieved from: http://evalu-ate.org/featured_resources/resources/ate_logic_model_template/ on November 15, 2015.

Appendix A: RCNET Logic Model

Inputs	Activities	Outputs	Short-Term Outcomes	Mid-Term Outcomes	Long-Term Outcomes
NSF Funding	Standardized Nuclear Curriculum	1,102 ACAD learning objectives determined	Faculty learn to use teaching toolkits	Faculty improve instruction	Industry and regulatory more assured of nuclear employees' education and training
In-kind Contributions		Curriculum Review Committees established	RCNET students' interest in higher academic degrees increases	INPO adopts RCNET's curriculum	
RCNET Senior and Support Staff		Curriculum material purchased	RCNET reputation with industry increases	Nuclear culture created in partner colleges	Increased diversity in the technical workforce
Advisory Committee		Curriculum Material developed			
Industry Partners		Learning Repository	Best in class material collected	Nuclear industry and profession gain higher recognition	More higher academic degrees sought
Academic Partners		Web based database built			
External Evaluator	Professional Development	Events, courses, and webinars	Industry and job seekers' awareness of central job repository increases	Students gain skills on unique systems	
	Unique Systems Training	Academic and Industry Partnerships		www.gonuke.org becomes a central job tool for industry and job seekers	
	Academic and Career Pathways	Articulation agreements			
	Career Assistance	Job repository on website			
	Secondary Outreach and Diversity Recruitment	Promotional material developed and disseminated			
		Partnerships			
	Nuclear Outreach	Public relations and events			