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Nuclear waste cooperative agreement collaborative study for the Nevada System of Higher Education

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**Nuclear Waste Cooperative Agreement
Collaborative Study
For The
Nevada System of Higher Education**



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I. EXECUTIVE SUMMARY

The purpose of this report is to present to the Harry Reid Center (HRC), the Nevada System of Higher Education and the Department of Energy an evaluation of collaborative effort within the Nuclear Waste Cooperative Agreement of 2003; this “financial assistance” award (as administered by the Harry Reid Center on behalf of the Nevada System of Higher Education) has commissioned this study to analyze its compliance with a stated mission objective of collaboration. The analysis was completed during the months of November 2006 thru April 2007.

The Nevada System of Higher Education (NSHE) has a tremendous opportunity to establish the measurement of ‘Collaboration’ with the Department of Energy (DOE). In order to foster and manage collaboration, it must be defined and understood and then analyzed using a variety of methods.

The Harry Reid Center enlisted the aid of the Public Administration Department of the University of Nevada Las Vegas to complete the study. The faculty and the Program Director of the Nuclear Waste Cooperative Agreement provided oversight. This study allowed graduate students from UNLV to evaluate “collaboration” as it pertained to NSHE and DOE.

This study contains a summary of our methodology, findings and recommendations; information included in the analysis was collected from a limited number of “task managers” representing the Nevada System of Higher Education and the Harry Reid Center. No data was collected from the Department of Energy representatives.

In brief, the results of the study pointed out that communication between NSHE and DOE overall needed improvement. Interpretation of the data revealed that some Principal Investigators (PI) worked harder to maintain a relationship with DOE whereas a noticeable number of principal investigators did not show as good results. Also, NSHE researchers continued to work on tasks even though DOE had been sluggish at times in promptly distributing funds to NSHE. However, organizationally, NSHE proved to be very strong in the area of fiscal responsibility. Finally, the coordination between NSHE and DOE showed mixed results and the satisfaction level was lower because of limited data.

The study produced viable recommendations to assist NSHE in the recording and reporting of collaboration. NSHE can also expand upon the direction of this study and is encouraged to integrate transparent and natural collaboration measures into their operation. The following report describes this collaboration study in detail.



II. DESCRIPTION OF PROGRAM

As directed by the Nuclear Waste Policy Act (Amended in 1987), the Department of Energy (DOE) is directed to build a high level nuclear repository at Yucca Mountain, Nevada. Yucca Mountain is the identified site for storage unless proven to be unsuitable. Although the DOE is tasked with building the facility and storing nuclear waste at Yucca Mountain; the State of Nevada lawmakers are opposed to such a storage site within the state's boundaries.

The Nevada System of Higher Education (NSHE) is an independent research facilitator, soliciting research projects for the Department of Energy and other organizations. NSHE and DOE entered into a five year 50 million dollar Cooperative Agreement/Financial Assistance Award in 2003. This agreement provides for the conduct of independent, unbiased research; to collect, compile and produce scientific data. The data provided by the NSHE facilitated research is available to both the State of Nevada and the DOE. NSHE currently has two years remaining on the five-year agreement and has facilitated 23 projects (20 are considered research in nature, three are administrative). NSHE has also produced nearly one million data files for potential use by the DOE, the State of Nevada and other interested organizations.

III. DESCRIPTION OF PROBLEM

This study is commissioned to examine the types and levels of collaboration by the organization's researchers and the DOE counterparts. Although collaboration is a mission statement objective of the agreement, NSHE does not have a "feel" for how much collaboration is occurring between their researchers and the DOE, or in what forms it is occurring.



Collaboration has not been defined, analyzed, or tracked during the three completed years of the contract beyond that stated under the “Statement of Substantial Involvement” contained in the UCCSN Cooperative agreement (UCCSN is now NSHE). It is stated that,

“The Department will provide appropriate technical direction to the individual program elements, as it is determined to be necessary. The Department will participate throughout the project and conduct meetings with the participant regarding technical direction of the work conducted under this agreement. The Department staff members will attend meetings and participate in discussions of key development activities. The Department will review technical progress reports and provide input to these reports as deemed necessary.”

This is a research “area of interest” for three reasons: first, NSHE would like to substantiate efforts with formal agreement objectives. Second, NSHE would like to compete and receive another award with DOE and starts negotiating in that effort late 2007, and finally, to improve the tracking of collaboration for remainder of financial assistance period and beyond.

The development of both an academic and functional or operational definition of collaboration is necessary so that organizations involved in formal collaborative efforts may have a common core of knowledge with which to evaluate or be evaluated on collaboration. This definition must be applicable to all research settings within the Cooperative Agreement and agreeable to DOE for collaboration to be measured, quantified and explored.

IV. OBJECTIVES OF STUDY

The first objective of the study is to develop a uniform definition of collaboration for both the program sponsor as well as the researchers and principal investigators of the NSHE/DOE Cooperative Agreement. After completing an extensive literature review the



following is an academic definition based on the “Communication of the ACM” 2003 article, Understanding New Models of Collaboration for Delivering Government Services, by Sharon S. Dawes and Lisa Prefontaine:

“Collaboration is a reciprocal and voluntary agreement between two or more distinct public sector agencies, or between public and private or non-profit entities, to deliver government services. In general these relationships involve a formal agreement about roles and responsibilities. The participating organizations share a common objective aimed at the delivery of a public service. They also share tangible and intangible risks, benefits and resources.”

Although the academic definition provided an excellent basis for collaboration, it is too broad to effectively and definitively measure. Therefore a functional definition, or rather a “catch phrase” was adapted for evaluation purposes. The functional or operational definition for Collaboration has been modified from a formula found in the 1996 article Collaborative Communication in Relationships: Moderating Effects of Integration and Control by Jakki J. Mohr, Robert J. Fisher, and John R. Nevin. This following definition is the basis for the analysis section of the study and is applicable to a scientific research setting.

Collaboration = CO-Operation + Coordination + Communication + Commitment + Performance.

A second objective of the study is to design and execute measurement tools for NSHE/HRC for use both initially for study purposes and additionally for the organization to use at an interval suitable to their needs for further measurement and validation. Measurement tools should include both qualitative and quantitative measures so as to measure organizational and



personal opinions/attitudes as well as established objective criteria or criteria that the program sponsor wishes to emphasize within the organization.

The third objective of the study is to make the study sponsor aware of current mandatory and unsolicited collaborative efforts occurring within the organization to determine if program changes are necessary to help facilitate this effort. By creating both an academic and functional definition for the organization to use, and developing measurement tools for the study, NSHE/HRC have the applications necessary to get a “feel” for the amount and types of collaboration occurring between tasks and the DOE.

V. PROCESS OF PROGRAM

In defining the process of the program it should be noted that the scope of this evaluation is not to change the “process” but to incorporate measurement tools to track collaboration as it is currently happening. There was however a review of the program process and can be seen both pictorially and as a summation of the NSHE website description of the program (See Appendix B).

The ‘touch’ points where NSHE and DOE exchange information were key to identifying the process in which to examine collaboration. The first touch point occurs when NSHE initiates a proposal to DOE to perform research task for DOE. After evaluating the proposal, the second touch point occurs when DOE sends a response to NSHE in reference to NSHE’s proposal. Ideally, DOE would fund the task proposal presented by NSHE. If DOE funds the proposal, the third touch point occurs when NSHE sends progress reports to DOE in relation to the funded



task. Finally, the last touch point occurs when NSHE delivers the product of the proposal to DOE.

At each touch point, collaboration occurs. There are many points of collaboration internal to NSHE and DOE; however, they were out of scope for this evaluation. The target of this evaluation was to measure collaboration between NSHE and DOE. Examination of the process of the program provided sources for surveys, organizational contacts, and observations.

VI. EVALUATION METHODOLOGY

Defining collaboration and developing the tools to measure collaboration within the NSHE organization should be considered exploratory research in nature. In an ideal academic setting or perfect world experience, both quantitative and qualitative data would be collected and used to draw conclusions and recommendations. A mixed method approach was initially planned and considered the following:

- Literature Review of Academic Journals relating to collaboration.
- A definition of Collaboration was borrowed from a peer reviewed journal
- The definition was adapted to fit the organization being evaluated
- Regular interviews with stakeholders/program sponsor were conducted
- Document review of the organization was completed
- Focus group interviews were conducted to help shape a survey
- A general survey instrument was created for use by all levels of the organization (qualitative in nature).



- A data structure “survey” was created to glean quantitative information for analysis (quantitative in nature)
- A narrowed “survey instrument” was created to be answered by people identified by purposive sampling method (Principal Investigators identified as sampling group).

VII. CONSTRAINTS & PROBLEMS ENCOUNTERED

At the start of the evaluation project, the evaluation team was informed of the constraint of not being able to directly contact DOE personnel. This constraint established boundaries around the breadth of the evaluation in a sense that most opinions on the health of collaboration would be coming from NSHE. The evaluation team would, however, be able to use the program sponsor as a conduit to the DOE. The program sponsor provided a survey to DOE on behalf of the evaluation team. Unfortunately, DOE did not complete the survey. As a result, the findings of this evaluation cannot leverage the viewpoints of DOE against the viewpoints of NSHE in relation to collaboration.

NSHE budgetary externalities impeded the evaluation team’s ability to collect data from one of its two surveys. The missed survey was qualitative and focused on collecting information such as: ‘The number of White Papers/Journals produced by NSHE’ or ‘the number of users that used data produced by NSHE’ and so forth. As a result, the findings of this evaluation cannot be as well rounded as intended. However, useful information was gleaned from the data structure survey that was executed and can be used to provide direction for further investigation by NSHE if desired.



VIII. RESULTS OF EVALUATION

Coding labels are used to rate components in the categories of communication, coordination, cooperation, commitment and performance based on the results of the data structure survey. The codes were labeled as follows: ‘Very Good’ (8 points), ‘Good’ (7 points), ‘Fair’ (6 points), ‘Poor’ (3 points) and ‘Very Poor’ (1 point). These categories were used to quantify survey results. As stated earlier, NSHE has a total of 23 tasks, some tasks are more scientific or research in nature (see Table 1 in Appendix A) and some task are more administrative in nature (see Table 2 in Appendix). This study focuses more on the research type of tasks.

Category 1: COMMUNICATON

The results show that Principal Investigators (PI) presented their task at symposiums to an audience other than DOE a total of 70 times (see Table 3 in Appendix A). Seventy presentations appear significant on the surface, however, 2 tasks account for 50% of the symposiums. The effort to present task at symposiums is carried mostly by a those 2 task Principal Investigators. Seven tasks were not presented at symposiums (35% of tasks). The purpose of this measure was to evaluate how well NSHE was communicating out to the broader scientific community. The results of this measure earned a *‘fair’* rating.

The results show that Principals Investigators presented their task to DOE a total of 37 times. Only a small number of tasks (3) did not present their tasks to DOE. Nineteen percent of tasks presented their task to DOE at least once. Overall the principal investigators that presented their tasks to DOE were more uniformed (see Table 4 in appendix A). The purpose of



this measure was to evaluate how well NSHE was communicating to DOE on their tasks. The results of this measure earned a *'good'* rating.

The result shows that Principals Investigators met with DOE on their tasks a total of 177 times. The 177 meetings with DOE were not closely uniformed across tasks. One task PI met with DOE 100 times (see Table 5 in Appendix A) or 56% of the total meetings. The results of this measure earns of a *'poor'* rating.

Category 2: COORDINATION

The results show that a significant number of Principal investigators did not attend DOE meetings for their tasks (see Table 6 in Appendix A). Since there are 20 scientific or research related tasks, the translation is that 45% of tasks (or 9), PIs did not attend meetings for their task. A balanced number of occurrences reveal, that the DOE meetings attended by Principal Investigators were more uniformed. The purpose of this measure was to evaluate how well (NSHE) PI's coordinated with the DOE. The results of this measure earned a *'poor'* rating.

NSHE has a low rate of formal changes in their task because of scope, schedule and cost. Results imply that NSHE has done a good job of sizing, timing, and costing their research task. The purpose of this measure was to evaluate the volume of task changes. The results of this measure earned a *'very good'* rating.

Category 3: COOPERATION

Measurements in the area of cooperation could not be obtained because the survey to capture cooperation had to be abandoned because of budgetary externalities that impacted NSHE. Because of uncontrollable circumstances, a rating cannot be given for cooperation.



Category 4: COMMITMENT

The results show that NSHE tasks were subjected to adverse funding issues at a 50% rate (see Table 8 in Appendix A). Although, funds can be allocated for a task, the delivery of the funds can also be held up for various reasons. The purpose of this measure was to evaluate funding through output. Research revealed that NSHE continues to work on task although there may be funding complications. The results of this measure earned a *'fair'* rating.

Fifty percent of tasks reported on by NSHE have slipped their reporting deadlines (see Table 9 in Appendix A). The purpose of this measure was to evaluate NSHE's commitment to maintaining reporting schedules. The results of this measure earned a *'poor'* rating.

Ninety Six percent of the tasks worked on by NSHE are within budget (see Table 10 in Appendix A). Only one task is reported to be over budget. The purpose of this measure was to evaluate NSHE's commitment in being accountable to the funds provided by DOE for task work. The results of this measure earned a *'very good'* rating.

Category 5: PERFORMANCE

Research results reveal that 12 tasks were completed by NSHE. Nine tasks are over their completion estimates whereas 3 tasks were under their estimates (see table 11 in Appendix A). The 3 tasks that were under estimates were under their estimates because DOE had stopped those tasks. The purpose of this measure was to evaluate NSHE's ability to deliver on task in a timely manner. The results of this measure earned a *'poor'* rating. Survey results that measured DOE's satisfaction for each task was not returned so a rating cannot be determined.



COLLABORATION RATING

The ‘Communication’ category ratings were fair (6), good (7), and poor (3) resulting in a total score of 16. The ‘Coordination’ category ratings were poor (3), and very good (8) resulting in a score of 11. In the area of ‘Cooperation’ data was not able to be collected so a score of 0 will be given. The ‘Commitment’ category ratings were fair (6), poor (3), and very good (8) for a score of 17. The ‘Performance’ category rating was poor (3). There were a total of 9 evaluation scores for a total score of 72 (9 times the maximum code rating of 8 (Very Good)). Using a weighted summary rating scale, the following table shows an overall collaboration measure for NSHE.

Level	Score	Logic
Excellent	64.8	90% of Total
Very Good	57.6	80% of Total
Good	50.4	70% of Total
Fair	43.2	60% of Total
Needs Improvement	36.0	50% of Total

The total collaboration score for NSHE is 43 (Communication (16) + Coordination (11) + Cooperation (0) + Commitment (17) + Performance (3)). Collaboration between NSHE and DOE was rated ‘Fair’ as result of this study.

IX. RECOMMENDATIONS OF EVALUATION

Principal Investigators have the responsibility of producing quarterly reports in relation to their tasks and it is one of the missions of the cooperative agreement to foster collaboration. It is recommended that collaboration measures be surreptitiously integrated into quarterly reports. Secretly placing collaborative measures in the quarterly report allows the PI to naturally complete the collaborative measures without bias to influence results. NSHE can expand on the collaborative formula (i.e., Collaboration = Communication + Coordination + Cooperation +



Commitment + Performance) from this study or develop another method. The implementation of this process will address the question of NSHE to understand the level collaboration (or lack of) on its operation. This process will also allow NSHE to baseline collaboration.

Recommendations by Category:

Category 1:CO-Operation

Although data was not collected in this category because of external issues, the analysis team recommends that NSHE should expect to meet and exceed real or perceived expectations stated in the Financial Assistance Award of 2003. By fostering this attitude, the atmosphere becomes less about the individual task and the DOE and more about organizational and group thinking. Through observations it was noted that current task culture perceives there to be a “contract” culture with the Harry Reid Center and that as such a spirit of cooperative culture has not been perceived and fostered.

Category 2: Coordination

It is recommended that Principal Investigators meet with their DOE counterparts at least once a fiscal year. While this meeting may appear to take away time and financial resources, the meetings will further accentuate the collaborative efforts of the NSHE researchers with the DOE.

Category 3: Communication

The evaluation team analyzed the workflow interaction between NSHE and DOE and concluded that there is no feedback to NSHE once reports are provided to DOE. It is recommended that a process be established to allow DOE to provide feedback on tasks specified in quarterly reports. To protect the anonymity of DOE personnel, identifying information should not be required.



A general theme made by focus group participants is that a more direct communication link between researchers/PI and the DOE be established. It is perceived that most communication occurs through the conduit of the administrative body of the program at the HRC. Although the suggestion of “informal communication” might be suited to some tasks over others, the recommendation does not take into consideration internal issues such as the personalities of NSHE researchers or DOE personnel.

Category 4: Commitment

Recommendations in this category include emphasizing the need and use of symposiums, workshops and conferences in support of their research for DOE. Even with the understanding that budgets are constrained, getting “out there” and discovering work and techniques of other researchers as well as highlighting your own research interests offers networking opportunities for future collaborative efforts.

Also in this category is the suggestion that the administrative arm of the program take an active role of knowing where projects are in terms of time and scope. Although quarterly reports are currently used for this purpose, by the time the quarterly reports are submitted, it is usually too late for any further help or intervention for the individual research tasks.

Category 5: Performance

NSHE does not currently track the accessing of the data they produce. It is recommended that NSHE update their website to track agency identifying information of the agencies that download their data. The implementation of tracking would provide a list of potential collaborators for their research. In addition, NSHE would be able to quantify the types of data that is most desired by the scientific community. Although the program sponsor has stated that



there is a method of tracking, it is cumbersome and may not yield the desired results. Beyond the scope of this paper, the tracking of data usage might be more suited to the scientific community at large and not just that of the DOE.



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